VES-1000 Series

VDSL-Ethernet Switches

May 2002

Version 3.40

User's Guide

ZyXEL

TOTAL INTERNET ACCESS SOLUTION

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Preface

Congratulations on your purchase from the VES-1000 Series of VDSL-Ethernet Switches.

This preface introduces you to the VES-1000 Series and discusses the organization and conventions of this User's Guide. It also provides information on other related documentation.

About VDSL

VDSL (Very high bit rate Digital Subscriber Line) is one type of DSL with very high data rates. The service can be asymmetrical or symmetrical and can be used on the same wire as the POTS (Plain Old Telephone Service) network and ISDN.

About the VES-1000 Series

The VES-1000 Series of VDSL-Ethernet Switches delivers high-performance broadband access at low cost to multi-tenant unit (MTU) buildings (hotels, motels, resorts, residential multi-dwelling units, office buildings, university campuses, etc.) and public facilities, such as convention centers, airports, plazas, and train stations. It attains speeds ranging from 1.56 Mbps to 16.67 Mbps upstream and 4.17 Mbps to 16.67 Mbps downstream at distances of up to 1.5 Km (5,000 feet) delivered over ordinary telephone lines.

There are currently two models in the VES-1000 Series of Ethernet Switches. The compact VES-1008 (one rack-unit (1U) high) can be mounted on a wall or placed on a rack. It has built-in voice-signal splitters for added system stability. In addition to remote management capability, a console port is used for local management. This 8-port switch is equipped with VLAN (Virtual LAN) capability that can isolate each port. You can connect up to 8 subscriber devices such as VDSL converters to this switch (ports 1 to 8). The VES-1012 extends on the flexibility of the VES-1008 as it provides 12 ports that allow for the connection of up to 12 individual subscribers.

This guide caters for both models.

General Syntax Conventions

"Enter" means for you to type one or more characters and press the carriage return. "Select" or "Choose" means for you to select one from the predefined choices.

The SMT menu titles and labels are in **Bold Times** font. Predefined field choices are in **Bold Arial** font. Command and arrow keys are enclosed in square brackets. [ENTER] means the Enter, or carriage return key; [ESC] means the Escape key and [SPACE BAR] means the Space Bar.

For brevity's sake, we will use "e.g." as shorthand for "for instance", and "i.e." as shorthand for "that is" or "in other words" throughout this manual.

Unless specified, images of the VES-1012 are used throughout this document. The VES-1008 has 8 available Ethernet ports however the images used in this User's Guide show the 12 available ports that are featured on the VES-1012. Images that directly relate to the VES-1008 are used when referring to the key differences between the two models.

Related Documentation

Hardware Installation Guide

The Hardware Installation Guide gives more detailed hardware specification information and shows you how to install the unit.

ZyXEL Web Site

The ZyXEL download library at www.zyxel.com contains additional support documentation.

Glossary

Please refer to www.zyxel.com for an online glossary of networking terms.

Part I:

Getting Ready

This part acquaints you with the features and applications of the VES-1000 Series switches, instructs you how to make the hardware connections, understand the front panel LEDs and introduces the SMT (System Management Terminal).

Chapter 1
Getting to Know the VES-1000 Series of Switches

This chapter describes the key features, benefits and applications of the VES-1000 Series.

The VES-1000 Series of VDSL-Ethernet Switches multiplexes traffic from VDSL (Very high bit rate Digital Subscriber Line) subscribers into two 10/100M Ethernet ports that connect to a WAN network via an Ethernet switch.

The compact VES-1008 (only one rack-unit (1U) high) can be mounted on a wall or placed on a rack. It has built-in voice-signal splitters to minimize space requirement. In addition to remote management capability, a console port is used for local management. This 8-port switch is equipped with VLAN (Virtual LAN) capability that can isolate each port. You can connect up to 8 subscribers to this switch (ports 1 to 8). The VES-1012 extends on the flexibility of the VES-1008 as it provides 12 ports that allow for the connection of up to 12 subscribers.

1.1 Features

VDSL to Ethernet Switch

All the models in the VES-1000 Series of switches aggregates traffic from VDSL lines to the Fast Ethernet ports. Main switch features are:

- Transparent Bridge
- Port-based and IEEE 802.1Q VLAN

Integrated Splitters

The integrated splitters eliminate the need to use external splitters that separate voice-band and DSL signals. This minimizes installation space requirements.

10/100 Mbps Fast Ethernet Ports

The two Ethernet ports allow you to aggregate the ports into one logical link. This provides the opportunity for a faster network connection.

They allow for switches in the VES-1000 Series to connect to:

- A second level WAN switch
- Daisy-chain to other switches in the VES-1000 Series.

STP (Spanning Tree Protocol)

STP detects and breaks network loops and provides backup links between switches, bridges or routers. It allows a device to interact with other STP-compliant devices in your network to ensure that only one path exists between any two stations on the network.

IGMP snooping

With IGMP snooping, group multicast traffic is only forwarded to ports that are members of that group. IGMP Snooping generates no additional network traffic, allowing you to significantly reduce multicast traffic passing through your switch.

VDSL Modes and Rates

The VES-1000 Series supports the following DSLAM VDSL modes.

- 10Base-S giving upstream rates from 1.56 Mbps to 18.75 Mbps and downstream rates of 4.17 Mbps Kbps to 16.67 Mbps.
- ANSI Mode giving upstream rates from 1.56 Mbps to 6.25 Mbps and downstream rates of 4.17 Mbps to 16.67 Mbps.
- ETSI Mode giving upstream rates from 1.56 Mbps to 6.25 Mbps and downstream rates of 4.17 Mbps to 12.50Mbps.

IP Protocols

- IP Host (No routing)
- SNMP for management
  - SNMP V1 (RFC 1157)
  - Ethernet MIBs for Ethernet and VDSL ports (RFC-1213)
  - Bridge MIB (RFC-1493)
- Telnet for configuration and monitoring

Management

- Command-line interface
- Telnet
- SNMP

System Monitoring

- System status (link status, rates, statistics counters)
- Telnet, SNMP for configuration and monitoring
- Temperatures, voltage, fan speed reports (VES-1012 only) and alarms.

Security

- Password protection for system management
- Port-based VLAN
- IEEE 802.1Q VLAN

Compact Design for Limited Space

All of the VDSL-Ethernet switches in the VES-1000 Series have built-in voice-signal splitters. This means that service providers do not need to allocate extra space for external splitters.

Scalable Platform for Future Expansion

The flexible design of the VES-1000 Series allows service providers to start with minimum cost. As the number of users and applications increases, additional switches from the VES-1000 Series can be added to provide greater bandwidth.

1.2 Applications

The VES-1008 has 8 available VDSL ports as well as a combined USER/CO Telco connector. Expanding on this flexibility, the VES-1012 features 12 VDSL ports as well as separate CO and USER Telco-50 connectors. The applications and operating environment (and associated diagrams) presented in this chapter primarily focus on the VES-1012; however they are equally applicable for the VES-1008.

The following are typical VDSL applications for the VES-1000 Series of switches:

1. Multiple Tenant Unit (MTU)
2. Enterprise
3. Campus

1.2.1 MTU Application

The following figure depicts a typical application for a VDSL-Ethernet Switch in a large residential building, or Multiple Tenant Unit (MTU), that leverages existing phone line wiring to provide Internet access to all tenants.

A tenant connects a computer to the phone line in a unit using a VDSL modem. The other end of the phone line is connected to a port on a VES-1000 Series switch. The VES-1000 Series switch aggregates the traffic from the tenants to the Ethernet port and forwards it to a router or switch. The router (or switch) then routes the traffic further to the Internet.

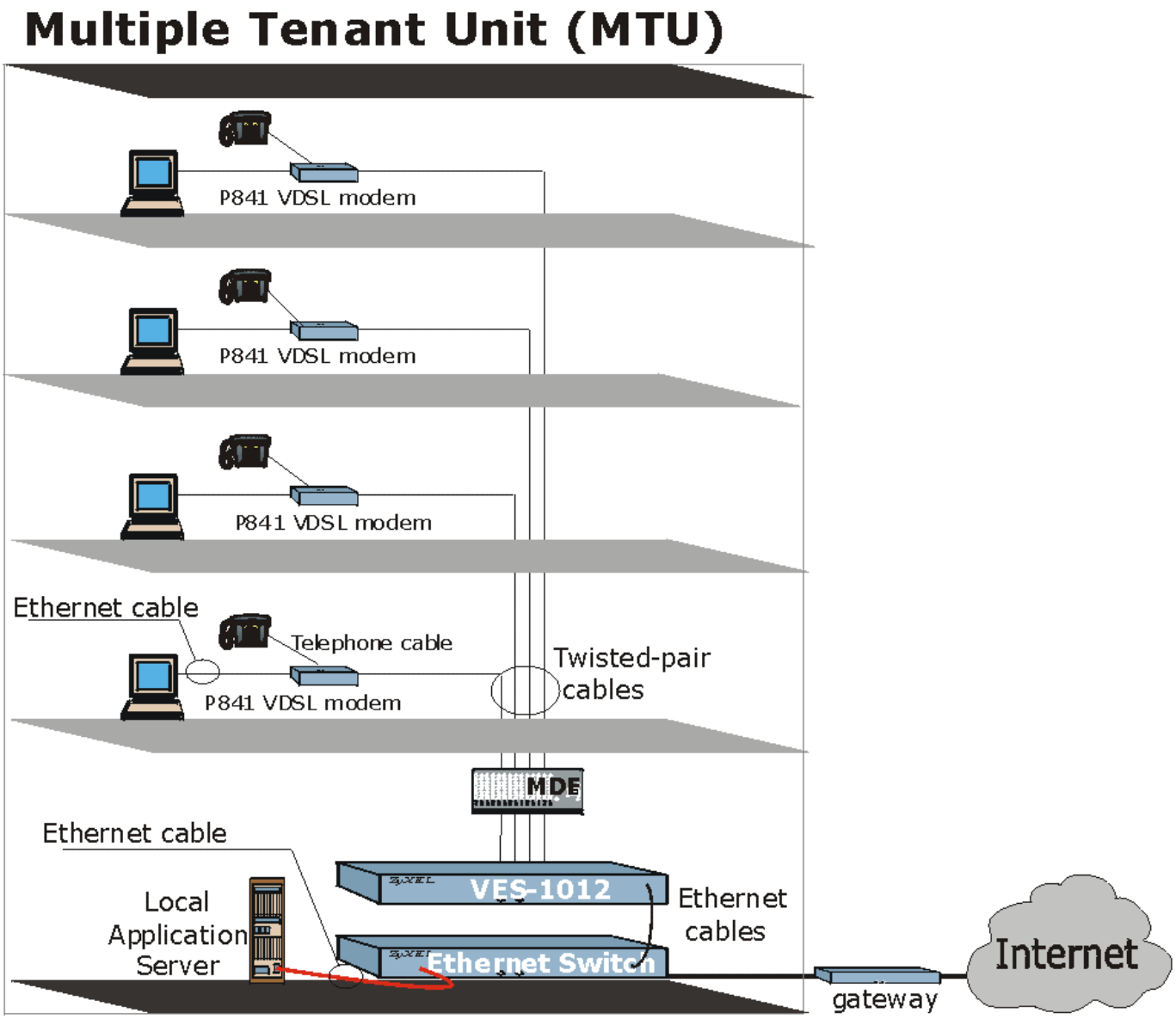


Figure 1-1 Building Deployment Example Using a VES-1012

1.2.2 Enterprise Application

The VES-1000 Series of switches can also be used in any-sized company to multiplex employee VDSL connections to the Internet.

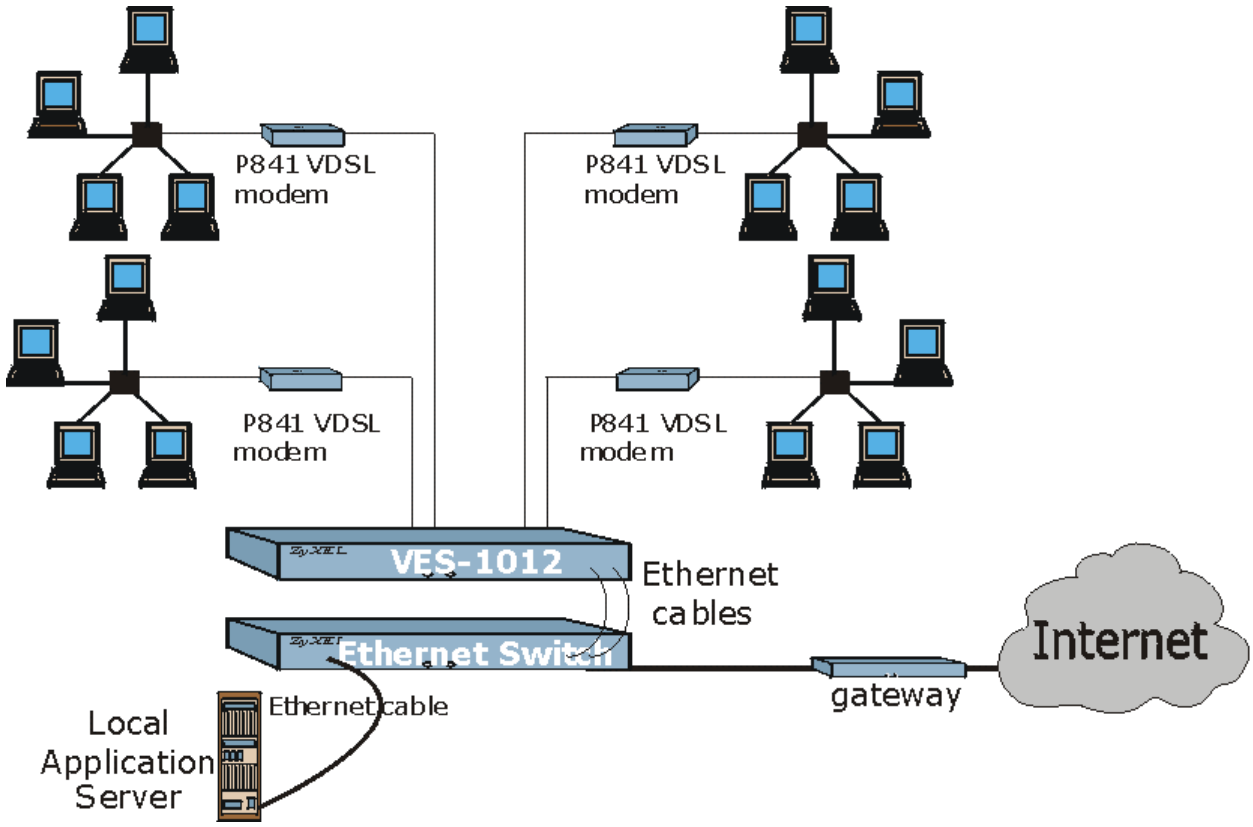


Figure 1-2 Enterprise Application Using a VES-1012

1.2.3 Campus Application

Independent networks can also have VDSL connections multiplexed to a gigabit switch or fiber ring using a VES-1000 Series switch.

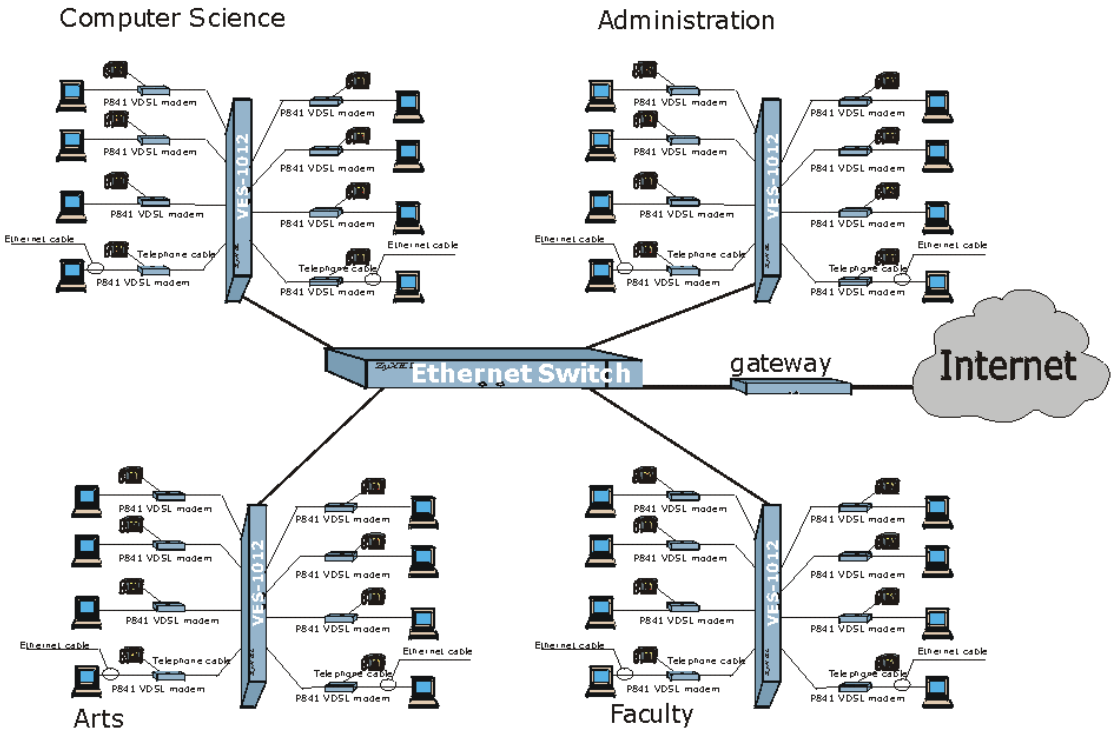


Figure 1-3 VES-1012 Example of a Campus Application Using a Gigabit switch

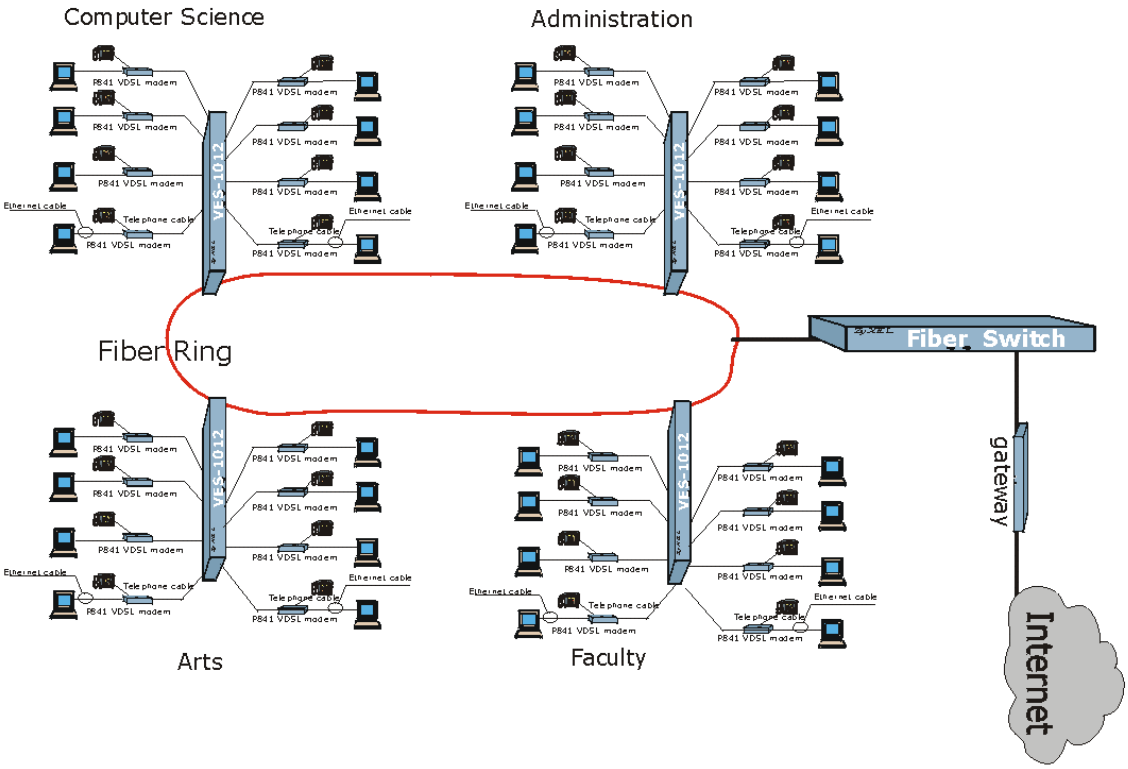


Figure 1-4 VES-1012 Example of Campus Application Using a Fiber Ring

Chapter 2
Hardware Connections

This chapter gives a brief introduction to the VES-1000 Series hardware.

2.1 Additional Installation Requirements

In addition to the contents of the package, you need the following hardware and software components before you install and use your product:

- A computer with a 10/100M Ethernet NIC (Network Interface Card)
- A computer with terminal emulation software configured to the following parameters:
  - VT100 terminal emulation
  - 9600 bps
  - No parity, 8 data bits, 1 stop bit
  - No flow control

2.2 Back Panel

The following figure shows the back panel for the VES-1012 only. The VES-1008 differs in that the 12 volt DC power socket is located on the front panel. There are no sockets or switches on the back panel of the VES-1008.

Figure 2-1 VES-1012 Back Panel

2.2.1 Power Connector

Make sure you are using the correct power source.

The VES-1008 has a 12 volt DC power socket located on the front panel. This allows for the convenient placing of the unit in locations where space may be a limitation. To connect the power to the unit, insert the round end of the plug on the supplied power adaptor into the power socket on the front panel. Connect the other end of the supplied power adaptor to a power outlet. Always use the ZyXEL supplied power supply as the VES-1008 may be damaged if third party power adaptors are used.

To connect the VES-1012 only, plug the female end of the power cord to the power receptacle on the rear panel. Connect the other end of the cord to a power outlet. Make sure that no objects obstruct the airflow of the fans (located on the side of the unit).

2.3 Front Panel

The following figure shows the front panel of the VES-1012 only. The VES-1008 has a combined USER/CO Telco-50 connector and displays 8 VDSL ports instead of the 12 that are on the VES-1012. The VES-1008 also has the socket and switch for the power supply located on the front panel.

Figure 2-2 VES-1008 Front Panel

Figure 2-3 VES-1012 Front Panel

2.4 Front Panel Ports

Table 2-A VES-1000 Series Switches: Front Panel Ports

VES-1008 FRONT PANEL PORTS	
CONNECTOR	**DESCRIPTION**
CONSOLE	The CONSOLE port is an RS-232 port for local configuration of the VES-1000 Series switch.
USER/CO	The combined USER/CO port is a Telco-50 connector for external POTS/ISDN and VDSL connections.
Two 10/100 Mbps RJ-45 connectors	These ports connect to a Ethernet switch or WAN router.
VES-1012 FRONT PANEL PORTS	
CONNECTOR	**DESCRIPTION**
CONSOLE	The CONSOLE port is an RS-232 port for local configuration of the VES-1000 Series switch.
CO	The CO Telco-50 port connects to the central office or a PBX.
USER	The USER Telco-50 port connects to the user (subscriber) VDSL equipment.
Two 10/100 Mbps	These ports connects to a Ethernet switch or WAN router.

Table 2-A VES-1000 Series Switches: Front Panel Ports

VES-1008 FRONT PANEL PORTS	
CONNECTOR	**DESCRIPTION**
CONSOLE	The CONSOLE port is an RS-232 port for local configuration of the VES-1000 Series switch.
USER/CO	The combined USER/CO port is a Telco-50 connector for external POTS/ISDN and VDSL connections.
Two 10/100 Mbps RJ-45 connectors	These ports connect to a Ethernet switch or WAN router.
VES-1012 FRONT PANEL PORTS	
CONNECTOR	**DESCRIPTION**
RJ-45 connectors	

2.4.1 Console Port

For the initial configuration, you need to use terminal emulator software on a computer and connect it to the console port on the VES-1000 Series switch. Connect the male 9-pin end of the console cable to the console port of the VES-1000 Series switch. Connect the other end (either a female 25-pin or female 9-pin) to a serial port (COM1, COM2 or other COM port) of your computer. You can use an extension RS-232 cable if the enclosed one is too short. After the initial setup, you can modify the configuration remotely through a telnet connection.

2.4.2 VDSL Port Connections

The VES-1008 has a combined USER/CO Telco-50 connector and this is used for external POTS/ISDN and VDSL connections (Appendix B - Diagram 2 shows the pin assignments for the combined Telco-50 connector). Supplied with the VES-1008 is a cable that is designed to fit into the combined USER/CO socket and it is a requirement for the installer to configure the other end of the cable to suit their installation requirements.

The Phone Port pins (pins 1-8 and 26-33) connect to the Main Distribution Frame (MDF) that is usually located in the multi-tenant unit. Eight separate phone connections from different subscribers are available to be used on the VES-1008 and each of their phone connections are required to be connected to their respective port on the MDF. The VDSL Port pins are used to connect the VES-1008 to the VDSL modems (for example, ZyXEL's Prestige 841). As with the phone port pins, each VDSL port requires 2 separate pins. Eight separate VDSL ports are available on the VES-1008 and each port is available to a separate subscriber or user.

Diagram 2 details the pin assignments for the VES-1008 Phone and VDSL ports.

For the VES-1012 only, connect the lines from the user equipment (VDSL modems) to the **USER** port and the lines from the central office switch or PBX (Private Branch Exchange) to the **CO** port. Make sure that the **USER** line and the **CO** lines are not shorted on the MDF (Main Distribution Frame).

The line from the user carries both the VDSL and the voice signals. For each line, switches in the VES-1000 Series have a built-in splitter that separates the high frequency VDSL signal from the voice band signal and feeds the VDSL signal to the VES-1000 Series switch, while the voice band signal is diverted to the CO port.

2.4.3 10/100M Auto-Sensing Ethernet

VES-1000 Series switches have two 10/100Mbps auto-sensing Ethernet ports. There are two factors related to Ethernet: speed and duplex mode. In 10/100Mbps Fast Ethernet, the speed can be 10Mbps or 100Mbps and the duplex mode can be half duplex or full duplex. The auto-negotiation capability makes one Ethernet port able to negotiate with a peer automatically to obtain the connection speed and duplex mode that both ends support.

When auto-negotiation is turned on, an Ethernet port on the VES-1000 Series switch negotiates with the peer automatically to determine the connection speed and duplex mode. If the peer Ethernet port does not support auto-negotiation or turns off this feature, the VES-1000 Series switch determines the connection speed by detecting the signal on the cable and using half duplex mode. When the VES-1000 Series switch's auto-negotiation is turned off, an Ethernet port uses the pre-configured speed and duplex mode when making a connection, thus requiring you to make sure that the settings of the peer Ethernet port are the same in order to connect.

You may also bundle the two Ethernet ports into one logical 200Mbps link.

Default Settings

The factory default settings for the Ethernet ports on the VES-1000 Series switch are:

- Speed: Auto
- Duplex: Auto
- Flow control: On
- Trunking: Disabled

Use a straight through Ethernet cable when connecting the VES-1000 Series switch to an Ethernet switch. Use a crossover Ethernet cable if you are daisy-chaining the VES-1000 Series switch to another and make sure trunking is disabled.

2.5 Front Panel LEDs

The following table describes the LED indicators on the front panel of a VES-1000 Series switch.

Table 2-B VES-1000 Series Switches: LED Descriptions

LED	COLOR	STATUS	DESCRIPTION
PWR	Green	ON	The system is turned on.
		OFF	The system is off.
SYS	Green	Blinking	The system is rebooting and performing self-diagnostic tests.
		ON	The system is on and functioning properly.
		OFF	The power is off or the system is not ready/malfunctioning.

Table 2-B VES-1000 Series Switches: LED Descriptions

LED	COLOR	STATUS	DESCRIPTION
ALM	Red	ON	There is a hardware failure.
		OFF	The system is functioning normally.
VDSL	Green	Blinking	The system is transmitting/receiving to/from the VDSL modem.
		ON	The link to the VDSL modem is up.
		OFF	The link to the VDSL modem is down.
10 Mbps	Green	Blinking	The system is transmitting/receiving to/from a 10 Mbps Ethernet network.
		ON	The link to a 10 Mbps Ethernet network is up.
		OFF	The link to a 10 Mbps Ethernet network is down.
100 Mbps	Yellow	Blinking	The system is transmitting/receiving to/from a 100 Mbps Ethernet network.
		ON	The link to a 100 Mbps Ethernet network is up.
		OFF	The link to a 100 Mbps Ethernet network is down.

Chapter 3
Introducing the SMT

This chapter shows you how to use the SMT (System Management Terminal) to configure a VES-1000 Series Switch.

3.1 Initial Screen

When you turn on your VES-1000 Series switch, it performs several internal tests and initializes the ports. After the initialization, the VES-1000 Series switch asks you to press [ENTER] to continue, as shown below:

```
Copyright (c) 2001 ZyXEL Communications Corp.
ethernet address: 00:a0:c5:00:50:02
Press ENTER to continue...
```

Figure 3-1 Power-On Display

3.1.1 Password

After you press [ENTER], the Login screen appears prompting you to enter the password, as shown in the next figure.

For your first login, enter the default password "1234". As you enter the password, the screen displays an (X) for each character you type.

```
Enter Password : XXXX
```

Figure 3-2 Login Screen

Please note that if there is no activity for longer than five minutes after you log in, your VES-1000 Series switch will automatically log you out and will display a blank screen. If you see a blank screen, press [ENTER] to bring up the password screen again.

3.2 Navigating the SMT Interface

The SMT (System Management Terminal) is the interface that you use to configure your VES-1000 Series switch.

Several operations that you should be familiar with before you attempt to modify the configuration are listed in the following table.

Table 3-A Navigating the SMT

OPERATION	KEYSTROKE	DESCRIPTION
Move down to another menu	[ENTER]	To move forward to a submenu, type in the number of the desired submenu and press [ENTER].
Move up to a previous menu	[ESC]	Press [ESC] to move back to the previous menu.
Move to a “hidden” menu	Press [SPACE BAR] to change **No** to **Yes** then press [ENTER].	Fields beginning with “Edit” lead to hidden menus and have a default setting of **No**. Press [SPACE BAR] once to change **No** to **Yes**, then press [ENTER] to go to the “hidden” menu.
Move the cursor	[ENTER] or [UP]/[DOWN] arrow keys.	Within a menu, press [ENTER] to move to the next field. You can also use the [UP]/[DOWN] arrow keys to move to the previous and the next field, respectively.
Entering information	Type in or press [SPACE BAR], then press [ENTER].	You need to fill in two types of fields. The first requires you to type in the appropriate information. The second allows you to cycle through the available choices by pressing [SPACE BAR].
Required fields	<?>	All fields with the symbol <?> must be filled in order to be able to save the new configuration.
N/A fields	<N/A>	Some of the fields in the SMT will show a <N/A>. This symbol refers to an option that is Not Applicable.
Save your configuration	[ENTER]	Save your configuration by pressing [ENTER] at the message “Press ENTER to confirm or ESC to cancel”. Saving the data on the screen will take you, in most cases to the previous menu.
Exit the SMT	Type 99, then press [ENTER].	Type 99 at the main menu prompt and press [ENTER] to exit the SMT interface.

3.3 SMT Menus At A Glance

The following figure gives an overall view of how the SMT menus are organized.

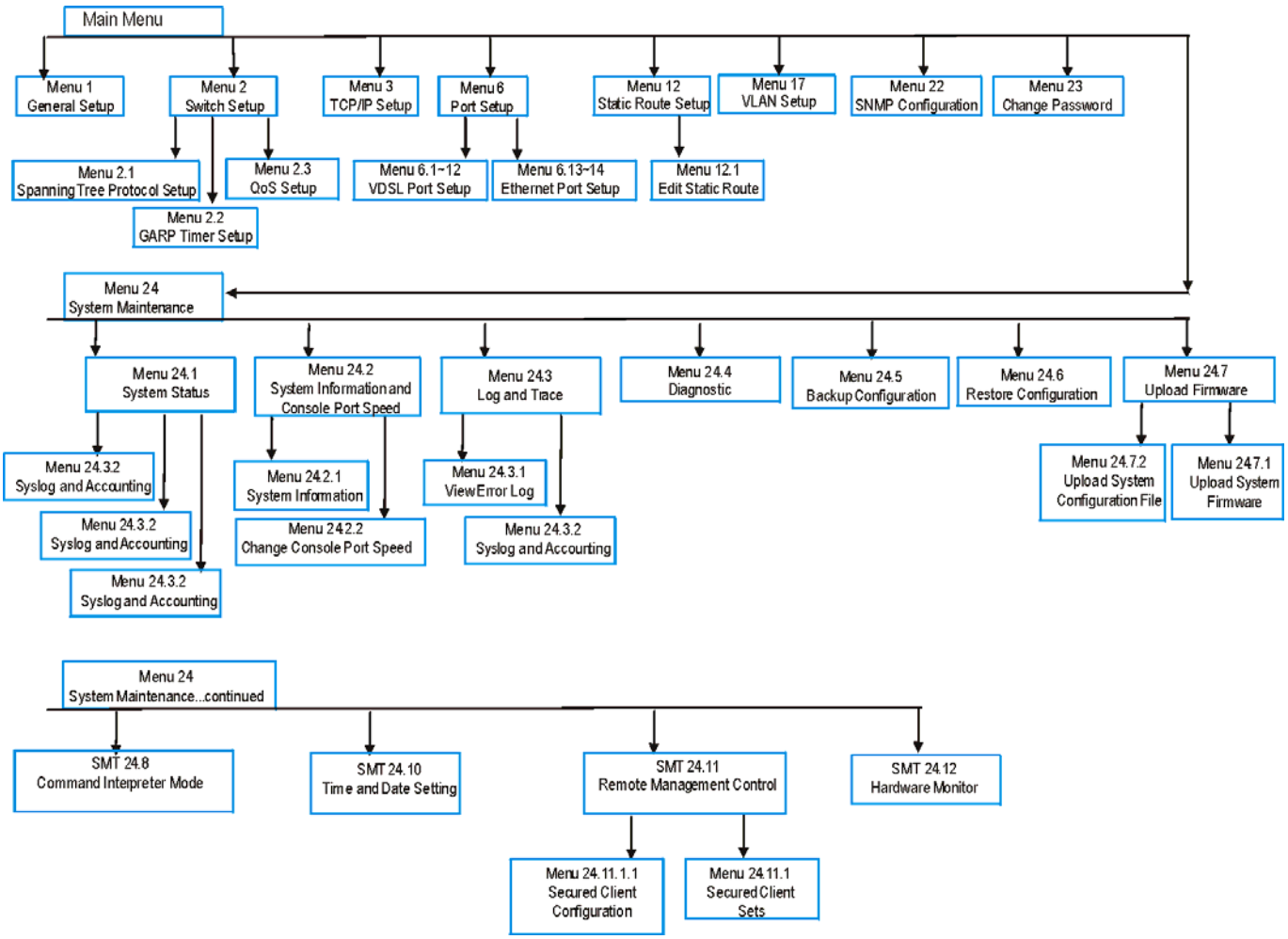


Figure 3-3 SMT Menus At A Glance

3.3.1 VES-1000 Series switch Main Menu

After you log in, the SMT displays a main menu.

```
          Copyright (c) 2000,2001 ZyXEL Communications Corp.

                      VES-1012 Main Menu (VDSL_1)

Getting Started                   Advanced Management
  1. General Setup
  2. Switch Setup                   22. SNMP Configuration
  3. IP Setup                       23. System Password
                                    24. System Maintenance


  6. Port Setup

Advanced Applications

  12. Static Routing Setup

  17. VLAN Setup
                                    99. Exit

                          Enter Menu Selection Number:
```

Figure 3-4 VES-1012 Main Menu

The following table shows the **VES-1000 Series switch Main Menu** summary:

Table 3-B Main Menu Summary

#	MENU TITLE	DESCRIPTION
1	General Setup	Use this menu to enter VES-1000 Series switch administrative information.
2	Switch Setup	Use this menu to set the switch parameters, including STP setup, GARP timers and QS parameters.
3	IP Setup	Use this menu to set up TCP/IP parameters such as the IP address, subnet mask and default gateway.
6	Port Setup	Configure your VDSL and Ethernet ports in this menu including individual port STP configuration.
12	Static Routing Setup	Use this menu to set up static routes.
17	VLAN Setup	Configure switch VLAN setup in this menu.
22	SNMP Configuration	Use this menu to set up SNMP related parameters
23	System Password	Use this menu to change your system password.
24	System Maintenance	Configure menus for System Status, System Information/Console Port Speed, Log and Trace, Diagnostic, Backup, Restore, Firmware Update, Command Interpreter Mode, Time and Date Setting, Remote Management Control and Hardware Monitor here.
99	Exit	To exit a system configuration/management session via SMT you must type 99. You then return to a blank screen.

3.4 Changing the System Password

It's important to change the default system password by doing the following:

Step 1. Enter 23 from the main menu. This will open **Menu 23 – Change Password** as shown next.

Step 2. Type the existing system password ("1234" is the default password when shipped), then press [ENTER].

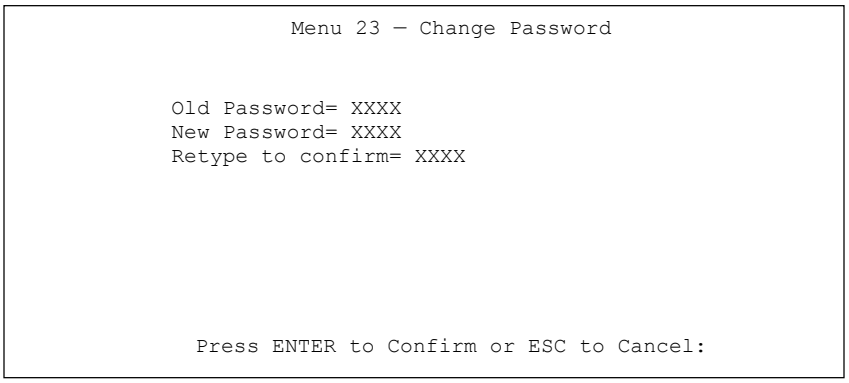

Menu 23 — Change Password
Old Password= XXXX
New Password= XXXX
Retype to confirm= XXXX
Press ENTER to Confirm or ESC to Cancel:

Figure 3-5 Menu 23.1 - System Password

Step 3. Enter your new system password and press [ENTER].

Step 4. Re-type your new system password for confirmation and press [ENTER].

3.4.1 Resetting the VES-1000 Series switch

If you forget your password or cannot access the VES-1000 Series switch, you will need to reload the factory-default configuration file. Uploading this configuration file replaces the current configuration file with the factory-default configuration file. This means that you will lose all configurations that you had previously and the speed of the console port will be reset to the default of 9600bps with 8 data bit, no parity, one stop bit and flow control set to none. The password will also be reset to "1234" and the IP address to 192.168.1.1.

To obtain the default configuration file, download it from the ZyXEL FTP site, unzip it and save it in a folder. Turn the VES-1000 Series switch off and then on to begin a session. When you turn on the VES-1000 Series switch again you will see the initial screen. When you see the message "Press any key to enter Debug Mode within 3 seconds" press any key to enter debug mode.

To upload the configuration file, do the following:

1. Type `atlc` after the `Enter Debug Mode` message.
2. Wait for the `Starting XMODEM upload` message before activating XMODEM upload on your terminal.
3. After a successful firmware upload, type `atgo` to restart the VES-1000 Series switch.

The VES-1000 Series switch is now reinitialized with a default configuration file including the default password of "1234".

Part II:

Getting Started

This part shows you how to configure the General Setup, Switch Setup, IP Setup and Port Setup SMT menus.

Chapter 4
General, Switch and IP Setup

This chapter describes SMT menus 1, 2 and 3.

4.1 General Setup

Use this menu to enter the administrative information for VES-1000 Series switch.

From the main menu enter 1 to bring up **Menu 1 – General Setup**.

```
                    Menu 1 - General Setup

          System Name = VDSL_1
          Location = Hsinchu
          Contact Person's Name = JohnDoe



          Press Enter to Confirm or ESC to Cancel:
```

Figure 4-1 Menu 1 – General Setup

The **Menu 1 — General Setup** fields are explained in the next table.

Table 4-A General Setup Fields

FIELD	DESCRIPTION	EXAMPLE
System Name	Choose a descriptive name for identification purposes. This name can be up to 30 alphanumeric characters long. Spaces are not allowed, but dashes "-" and underscores "_" are accepted. This name can be retrieved remotely via SNMP and will be displayed up to the first 9 characters at the prompt in the Command Mode.	VDSL_1
Note: Once you have configured the **System Name,** you can see it displayed (up to the first nine characters) in the main menu within brackets next to " VES-1012 Main Menu".		
Location (optional)	Enter the geographic location (up to 31 characters) of your VES-1000 Series switch.	Hsinchu
Contact Person's Name (optional)	Enter the name (up to 30 characters) of the person in charge of this VES-1000 Series switch.	JohnDoe
When you have completed this menu, press [ENTER] at the prompt "Press ENTER to Confirm…" to save your configuration, or press [ESC] at any time to cancel.		

4.2 Switch Setup

Enter 2 from the main menu to display **Menu 2 – Switch Setup**.

```
                              Menu 2 - Switch Setup

                        VDSL Mode= 10BaseS
                        VDSL Modem Firmware Auto Upgrade= Yes
                        Ethernet Port 13 and Port 14 Trunking= No
                        Edit Spanning Tree Protocol= No
                        Edit GARP Timer= No
                        VLAN Type= 802.1Q
                        IGMP Snooping= Disable
                        Edit QoS Support= No



                        Press ENTER to Confirm or ESC to Cancel:

Press Space Bar to Toggle.
```

Figure 4-2 Menu 2 - Switch Setup

Table 4-B Menu 2 – Switch Setup

FIELD	DESCRIPTION	EXAMPLE
VDSL Mode	Press [SPACE BAR] and then press [ENTER] to choose from **10BaseS, ETSI Plan 997** or **ANSI/ETSI Plan 998**.	**10BaseS**
VDSL Modem Firmware Auto Upgrade	Press [SPACE BAR], select **Yes**, and then press [ENTER] to allow automatic firmware upgrade of the subscribers VDSL modem.	**Yes**
Ethernet Port 13 and Port 14 Trunking	Ethernet port trunking is disabled by default. Press [SPACE BAR], select **Yes**, and then press [ENTER] to allow trunking (make sure the remote switch also supports trunking). Enable trunking (press [SPACE BAR], select Yes) only if you connect both Ethernet ports to a single switch. (Ethernet ports 13 & 14 relate to the VES-1012 switch only).	**No**
Edit Spanning Tree Protocol	Press [SPACE BAR] once to select **Yes** and then [ENTER] to display **Menu 2.1 - Spanning Tree Protocol Setup**.	**No**
Edit GARP Timer	Press [SPACE BAR] once to select **Yes** and then press [ENTER] to go to **Menu 2.2 — GARP Timer Setup**.	**No**
VLAN Type	Press [SPACE BAR] and then press [ENTER] to choose from **802.1Q** or **Port-Based**. See *section 4.2.8* for more information on VLANs. To enable IEEE 802.1Q on the VES-1000 Series switch, you must configure it for the switch in this menu, menu 6 port submenu(s) and menu 17 VLAN setup. Menu 17 is not applicable (N/A) if you choose port-based VLANs for the switch in menu 2.	**802.1Q**
IGMP Snooping	Press [SPACE BAR] once to select **Enable** and then press [ENTER]. Press [ENTER] again at the message “Press ENTER to Confirm…“ to activate IGMP snooping on the device.	**Disable**
Edit QoS Support	Press [SPACE BAR] once to select **Yes** and then press [ENTER to go to **Menu 2.3 — QoS Setup**.	**No**
When you have completed this menu, press [ENTER] at the prompt “Press ENTER to Confirm…” to save your configuration, or press [ESC] at any time to cancel.		

4.2.1 VDSL Mode

Each VDSL mode operates in a different frequency band allocation, resulting in different upstream and downstream speeds. The following table summarizes transmission speeds and frequency ranges for each VDSL mode supported by the VES-1000 Series switch.

Table 4-C VDSL Mode, Frequency Ranges and Speeds

VDSL MODE	FREQ. RANGE (Hz)		LINE SPEED (Mbps)				
10 Base-S							
Upstream	4.0M	7.9M	1.56	6.25	9.38	12.50	18.75
Downstream	900K	3.0M	4.17	6.25	8.33	12.50	16.67
ANSI/ETSI Plan 998							
Upstream	4.0M	5.0M	1.56	3.13	6.25		
Downstream	900K	3.0M	4.17	6.25	8.33	12.50	16.67
ETSI Plan 997							
Upstream	4.0M	5.0M	1.56	3.13	6.25		
Downstream	900K	2.7M	4.17	6.25	9.38	12.50	

4.2.2 Modem Firmware Upgrade

This option enables the uploading of VDSL modem firmware (the default is **No**) if the subscribers VDSL modem firmware is an older version than that of the VES-1000 Series switch. This ensures that all VDSL clients on the VES-1000 Series switch have the same firmware as the actual switch and avoids potential compatibility conflicts.

4.2.3 Ethernet Port Trunking

Ethernet port trunking lets you aggregate the Ethernet ports into one logical link. The VES-1000 Series switch uses MAC-based load balancing which analyzes a packet's source and destination MAC addresses to distribute the load between the two Ethernet ports when uplinking to the remote switch.

The remote switch to which the VES-1000 Series switch connects must also support Ethernet port trunking. The load-balancing method, however, does not have to be the same as on the VES-1000 Series switch.

Note that the two uplink ports must be connected to a single remote switch when port trunking is enabled. Disable trunking (default) if you wish to daisy-chain other VES-1000 Series VDSL switches. Daisy-chaining VES-1000 Series switches does degrade performance.

4.2.4 STP (Spanning Tree Protocol)

The use of STP in the majority of network environments is not recommended. Furthermore, this rarely used feature should not be enabled on the VDSL ports on the VES-1000 Series of switches.

STP detects and breaks network loops and provides backup links between switches, bridges or routers. It allows a device to interact with other STP-aware devices in your network to ensure that only one path exists between any two stations on the network.

The root bridge is the base of the spanning tree; it is the bridge with the lowest identifier value (MAC address). Path cost is the cost of transmitting a frame onto a LAN through that port. It is assigned according to the speed of the link to which a port is attached. The slower the media, the higher the cost - see the following table.

Table 4-D Path Cost

	LINK SPEED	RECOMMENDED VALUE	RECOMMENDED RANGE	ALLOWED RANGE
Path Cost	4Mbps	250	100 to 1000	1 to 65535
Path Cost	10Mbps	100	50 to 600	1 to 65535
Path Cost	16Mbps	62	40 to 400	1 to 65535
Path Cost	100Mbps	19	10 to 60	1 to 65535
Path Cost	1Gbps	4	3 to 10	1 to 65535
Path Cost	10Gbps	2	1 to 5	1 to 65535

On each bridge, the root port is the port through which this bridge communicates with the root. It is the port on this switch with the lowest path cost to the root (the root path cost). If there is no root port, then this switch has been accepted as the root bridge of the spanning tree network.

For each LAN segment, a designated bridge is selected. This bridge has the lowest cost to the root among the bridges connected to the LAN.

After a bridge determines the lowest cost-spanning tree with STP, it enables the root port and the ports that are the designated ports for the connected LANs, and disables all other ports that participate in STP. Network packets are therefore only forwarded between enabled ports, eliminating any possible network loops.

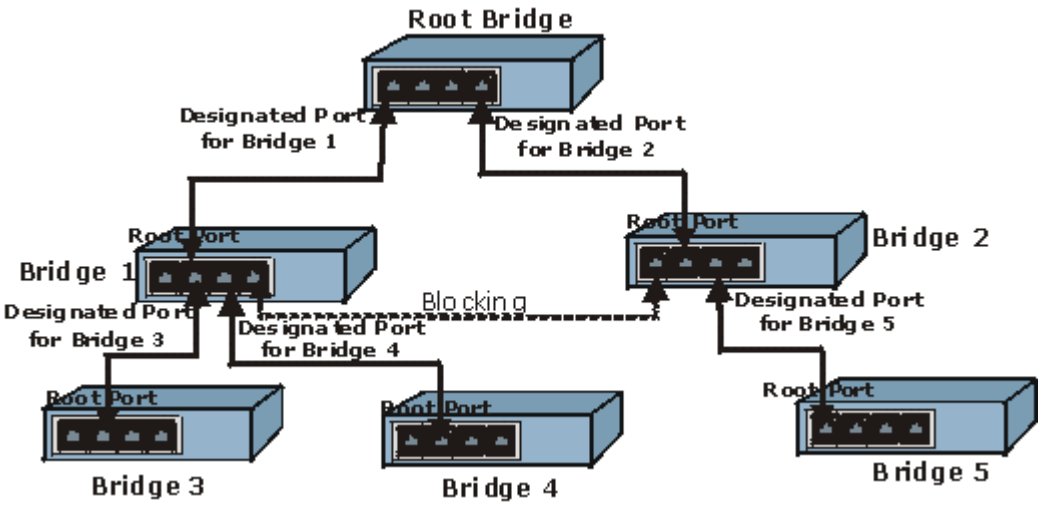


Figure 4-3 Root Ports and Designated Ports

STP-aware devices exchange Bridge Protocol Data Units (BPDUs) periodically. When the bridged LAN topology changes, a new spanning tree is constructed.

Once a stable network topology has been established, all devices listen for Hello BPDUs transmitted from the root bridge. If a device does not get a Hello BPDU after a predefined interval (Max Age), the device assumes that the link to the root bridge is down. This device then initiates negotiations with other devices to reconfigure the network to re-establish a valid network topology.

STP assigns five port states (see following table) to eliminate packet looping. A device port is not allowed to go directly from blocking state to forwarding state so as to eliminate transient loops.

Table 4-E Port States

PORT STATE	DESCRIPTION
Disabled	STP is disabled (default).
Blocking	Only configuration and management BPDUs are received and processed.
Listening	All BPDUs are received and processed.
Learning	All BPDUs are received and processed. Information frames are submitted to the learning process but not forwarded.
Forwarding	All BPDUs are received and processed. All information frames are received and forwarded.

4.2.5 Configuring STP on the VES-1000 Series Switch

To configure STP on the VES-1000 Series switch, select 2 from the main menu, go to the **Edit Spanning Tree Protocol** field, press [SPACE BAR] once to select **Yes** and then [ENTER] to display **Menu 2.1 - Spanning Tree Protocol Setup** menu.

```
                    Menu 2.1 - Spanning Tree Protocol Setup

          Spanning Tree Protocol= Disable
          Bridge Priority= 32768
          Bridge Hello Time(Time (sec)= 2
          Bridge Max Age(Age (sec)= 20
          Forward Delay(Delay (sec)= 15

          Press ENTER to Confirm or ESC to Cancel:

          Press Space Bar to Toggle.
```

Figure 4-4 Menu 2.1 Spanning Tree Protocol Setup

Table 4-F Menu 2.1 - Spanning Tree Protocol Setup

FIELD	DESCRIPTION	EXAMPLE
Spanning Tree Protocol	Press [SPACE BAR] to toggle between **Enable** and **Disable**.	**Disable**
Bridge Priority	Bridge priority is used in determining the root device, root port and designated port. The device with the highest priority (lowest numeric value) becomes the STP root device. If all devices have the same priority, the device with the lowest MAC address will then become the root device. The allowed range is 0 to 65535. The lower the numeric value you assign, the higher the priority for this bridge.	32768 (default)
Hello Time	This is the time interval in seconds between configuration message generated by the root device. The allowed range is 1 to 10 seconds.	2 (default)
Max Age	This is the maximum time (in seconds) a device waits without receiving a BPDU before attempting to reconfigure. All device ports (except for designated ports) should receive BPDUs at regular intervals. Any port that ages out STP information (provided in the last BPDU) becomes the designated port for the attached LAN. If it is a root port, a new root port is selected from among the device ports attached to the network. The allowed range is 6 to 40 seconds.	20 (default)
Forwarding Delay	This is the maximum time (in seconds) a device waits before changing states. This delay is required because every device must receive information about topology changes before it starts to forward frames. In addition, each port needs time to listen for conflicting information that would make it return to a blocking state; otherwise, temporary data loops might result. The allowed range is 4 to 30 seconds.	15 (default)

Bridge Priority determines the root bridge, which in turn determines Hello Time, Max Age and Forwarding Delay.

4.2.6 GARP Timer Setup

GARP (Generic Attribute Registration Protocol) allows network devices to register and de-register attribute values with other GARP participants within a bridged LAN. GARP is a protocol that provides a generic mechanism for protocols that serve a more specific application, for example, GVRP (GARP VLAN Registration Protocol). GARP and GVRP are the protocols used to automatically register VLAN membership across switches.

Switches join VLANs by making a declaration. A declaration is made by issuing a **Join** message using GARP. Declarations are withdrawn by issuing a **Leave** message. A **Leave All** message terminates all registrations. GARP timers set declaration timeout values.

Select **Yes** in the **Edit GARP Timer** field in menu 2 to go to **Menu 2.2 — GARP Timer Setup**.

```
                          Menu 2.2 - GARP Timer Setup

                  Join Timer(Timer (msec)= 200
                  Leave Timer(Timer (msec)= 600
                  Leave All Timer(Timer (msec)= 10000



                  Press ENTER to Confirm or ESC to Cancel:

The Range of Join Timer is between 100 and 65535.
```

Figure 4-5 Menu 2.2 GARP Timer Setup

Table 4-G Menu 2.2 - GARP Timer

FIELD	DESCRIPTION	EXAMPLE
Join Timer	**Join Timer** sets the duration of the Join Period timer for GARP in milliseconds. Each port has a Join Period timer. The allowed **Join Time** range is between 100 and 65535 milliseconds; the default is 200 milliseconds.	200 (default)
Leave Timer	**Leave Timer** sets the duration of the Leave Period timer for GARP in milliseconds. Each port has a single Leave Period timer. **Leave Timer** must be at least two times larger than **Join Timer**; the default is 600 milliseconds.	600 (default)
Leave All Timer	**Leave All Timer** sets the duration of the Leave All Period timer for GARP in milliseconds. Each port has a single Leave All Period timer. **Leave All Timer** must be larger than **Leave Timer**; the default is 10,000 milliseconds.	10000 (default)
Once you have completed filling in **Menu 2.2 — GARP Timer Setup**, press [ENTER] at the message “Press ENTER to Confirm… “ to save your configuration or press [ESC] at any time to cancel.		

4.2.7 GVRP

GVRP (GARP VLAN Registration Protocol) is a registration protocol that defines a way for switches to register necessary VLAN members on ports across the network. Enable this function to permit VLANs groups beyond the local switch. Please refer to the following table for common GVRP terminology.

Table 4-H GVRP Terminology

VLAN Type	Permanent VLAN	This is a static VLAN created manually.
	Dynamic VLAN	This is a VLAN configured by a GVRP registration/deregistration process.
VLAN Administrative Control	Registration Fixed	Fixed registration ports are permanent VLAN members.
	Registration Forbidden	Ports with registration forbidden are not allowed to register (join) this VLAN.
	Normal Registration	Ports join a VLAN using GVRP.
VLAN Tag Control	Tagged	Ports tag all (VLAN member) egress frames transmitted.
	Untagged	Ports don’t tag all (VLAN member) egress frames transmitted.

VLAN Port	Port VID	This is the VLAN ID assigned to untagged frames that this port receives.
	Acceptable frame type	Whether tagged only or both untagged frames are accepted on this port.
	Ingress filtering	If set, the device discards incoming frames for VLANs which do not include this port in its member set.

4.2.8 VLANs

A VLAN (Virtual Local Area Network) allows a physical network to be partitioned into multiple logical networks. Stations on a logical network belong to one group. A station can belong to more than one group. With VLAN, a station cannot directly talk to or hear from stations that are not in the same group(s); the traffic must first go through a router.

In MTU applications, VLAN is vital in providing isolation and security among the subscribers. When properly configured, VLAN prevents one subscriber from accessing the network resources of another on the same LAN, thus a user will not see the printers and hard disks of another user in the same building.

VLANs also increase network performance by limiting broadcasts to a smaller and more manageable logical broadcast domain. In traditional switched environments, all broadcast packets go to each and every individual port. With VLAN, broadcasts are confined to the members of the VLAN. Note that VLANs are unidirectional - they only govern outgoing traffic.

Port-based VLANS

Port-based VLANs are VLANs where the packet forwarding decision is based on the destination MAC address and its associated port.

As previously mentioned, VLANs are unidirectional. Therefore, if you wish to allow two subscriber ports to talk to each other, for example, between conference rooms in a hotel, you must define the egress (an egress port is an outgoing port, that is, a port through which a data packet leaves) for both ports.

Port-based VLANs are specific only to the switch on which they were created. The factory default port-based VLAN settings for VES-1000 Series switches are summarized below.

- Port 0 (the CPU management port) forms a VLAN with uplink ports and can use all Ethernet ports as the uplink.
- The VDSL ports cannot talk to each other.
- Each VDSL port forms a VLAN with the Ethernet ports and vice-versa.

Tagged VLANs (IEEE 802.1Q)

Tagged VLAN uses an explicit tag (VLAN ID) in the MAC header to identify the VLAN membership of a frame across bridges – they are not confined to the switch on which they were created. The VLANs can be created statically by hand or dynamically through GVRP. The VLAN ID associates a frame with a specific VLAN and

provides the information that switches need to process the frame across the network. A tagged frame is four bytes longer than an untagged frame and contains two bytes of TPID (Tag Protocol Identifier; residing within the type/length field of the Ethernet frame) and two bytes of TCI (Tag Control Information; a tagged header starts after the source address field of the Ethernet frame).

TPID	User Priority	CFI	VLAN ID
2 bytes	3 bits	1 bit	12 bits

TPID has a defined value of 8100 (hex). The first three bits of the TCI define user priority (giving eight priority levels). The CFI (Canonical Format Indicator) is a single-bit flag, always set to zero for Ethernet switches. The remaining twelve bits define the VLAN ID, giving a possible maximum number of 4,096 (2^{12}) VLANs.

Note that user priority and VLAN ID are independent of each other. A frame with VID (VLAN Identifier) of null (0) is called a priority frame, meaning that only the priority level is significant and the default VID of the ingress port is given as the VID of the frame.

Of the 4096 possible VIDs, a VID of 0 is used to identify priority frames and value 4095 (FFF) is reserved, so the maximum possible VLAN configurations are 4,094.

Each port on the switch is capable of receiving tagged or untagged frames. You can configure a VES-1000 Series switch to receive only tagged or all frames on a port-by-port basis. If it is set to tagged-only on a port, then only tagged frames are allowed to enter from that port and untagged frames are dropped; if set to all, then both tagged and untagged frames are allowed to enter the switch. The VES-1000 Series switch does not alter the VID of a frame if it is already tagged; however, when an untagged frame enters the switch, it is assigned the default port VID (PVID) of the ingress (incoming) port. Thus a frame always has a VID inside the switch, regardless of whether it is tagged or not on the wire. The default PVID is 1 for all ports, but this can be changed.

The egress (outgoing) port(s) of a frame is determined on the combination of the destination MAC address and the VID of the frame. For a unicast frame, the egress port based by the destination address must be a member of the VID, also; otherwise, the frame is blocked. For a broadcast (or multicast without IGMP snooping) frame, it is duplicated only on ports (except the ingress port itself) that are members of the VID, thus confining the broadcast to a specific domain.

Whether to tag an outgoing frame depends on the setting of the egress port on a per VLAN, per port basis (recall that a port can be members of multiple VID). If the tagging on the egress port is enabled for the VID of a frame, then the frame is transmitted as a tagged frame; otherwise, it is transmitted as an untagged frame.

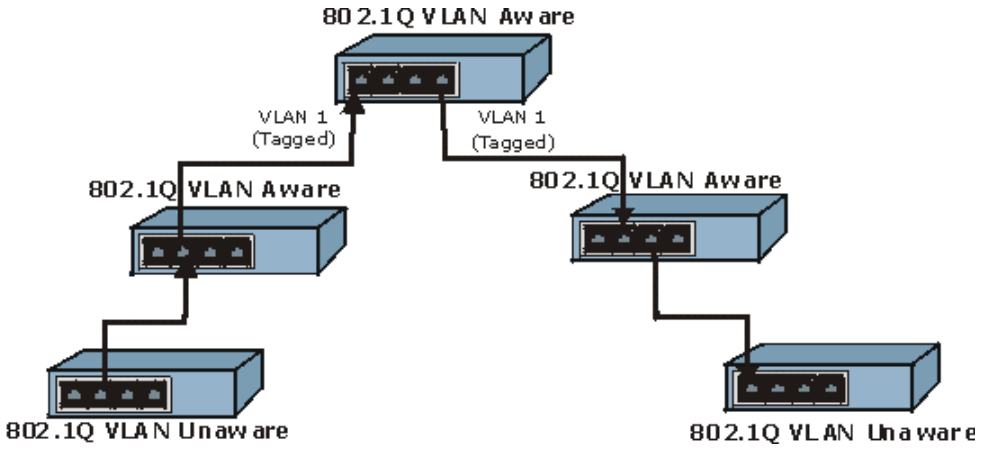


Figure 4-6 Forwarding Tagged/Untagged Frames to 802.1Q VLAN Aware/Unaware Devices

4.2.9 Quality of Service (QoS)

IEEE 802.1p defines up to 8 separate traffic classes by inserting a tag into a MAC-layer frame that contains bits to define class of service.

Table 4-I QoS Priority Listing

Priority 7	Typically used for network control traffic such as router configuration messages.
Priority 6	Typically used for voice traffic that is especially sensitive to jitter (jitter is the variations in delay.
Priority 5	Typically used for video that consumes high bandwidth and is sensitive to jitter.
Priority 4	Typically used for controlled load, latency-sensitive traffic such as SNA transactions.
Priority 3	Typically used for better than best effort; would include important business traffic that can tolerate some delay.
Priority 2	Typically used for best-effort traffic.
Priority 1	This is the default priority if none is specified.
Priority 0	Typically used for non-critical traffic such as backups, non-critical replications, some electronic mail and so on.

The switch has 4 physical queues to support the 8 priority levels for each port. On the switch, traffic assigned to higher index queues gets through faster while traffic in lower index queues is dropped if the network is congested. You use menu 2.3 to map the priority levels to physical queues.

Frames without explicit priority is given the default priority of the ingress port. You can use menu 6.1 and 6.2 to configure the default priority for each port.

To configure the priority level-to-physical queue mapping, select **Yes** in the **Edit QoS Support** field in menu 2 to go to **Menu 2.3 — QoS Setup**. The following figure displays the default queues for each priority level.

```
                        Menu 2.3 - QoS Setup

                  Priority Queue Assignment
                        Priority Level 7= Queue 3
                        Priority Level 6= Queue 3
                        Priority Level 5= Queue 2
                        Priority Level 4= Queue 2
                        Priority Level 3= Queue 1
                        Priority Level 2= Queue 0
                        Priority Level 1= Queue 0
                        Priority Level 0= Queue 1

                Press ENTER to Confirm or ESC to Cancel:
```

Figure 4-7 Menu 2.3 QoS Setup

Table 4-J Menu 2.3 - QoS Setup

FIELD	DESCRIPTION	EXAMPLE
Priority Level 7 to 0	Configure the priority-to-queue assignment for each port in this menu by pressing [SPACE BAR] to select a queue (Queue 0 to Queue 3) and then pressing [ENTER]. Queue 3 has the highest priority. Traffic assigned to higher index queue gets through faster while traffic assigned to lower index queue is dropped if the network is congested.	Queue 3
Once you have completed configuring **Menu 2.2 — QoS Setup**, press [ENTER] at the message “Press ENTER to Confirm… “ to save your configuration or press [ESC] at any time to cancel.		

4.3 TCP/IP Setup

From the main menu enter 1 to bring up **Menu 3 – TCP/IP Setup.**

4.3.1 TCP/IP Setup Parameters

The VES-1000 Series switch needs a static IP address for it to be managed over the network. The factory default IP address is 192.168.1.1. The administrator needs to assign a static IP address for the VES-1000 Series switch.

The subnet mask specifies the network number portion of an IP address. Your VES-1000 Series switch computes the subnet mask automatically based on the IP address that you entered. You don’t need to change the subnet mask computed by the VES-1000 Series switch unless you are instructed to do otherwise. The factory default subnet mask is 255.255.255.0.

The default gateway specifies the IP address of the default gateway (next hop) for outgoing traffic. The default gateway is specified as 192.168.1.254.

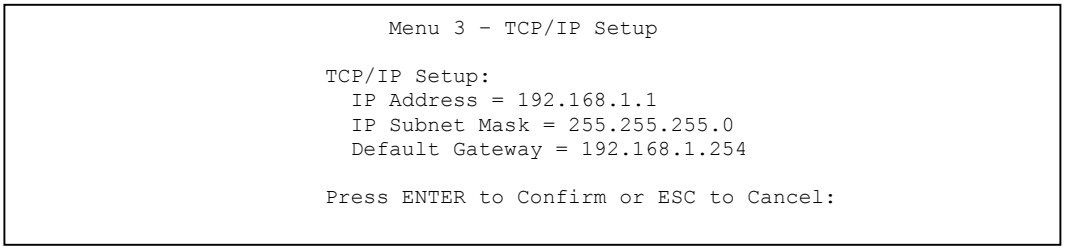

Menu 3 – TCP/IP Setup
TCP/IP Setup:
IP Address = 192.168.1.1
IP Subnet Mask = 255.255.255.0
Default Gateway = 192.168.1.254
Press ENTER to Confirm or ESC to Cancel:

Figure 4-8 Menu 3 – TCP/IP Setup

The **Menu 3 – TCP/IP Setup** fields are explained in the next table:

Table 4-K LAN TCP/IP Setup Menu Fields

FIELD	DESCRIPTION	EXAMPLE
TCP/IP Setup		
IP Address	Enter the IP address of your VES-1000 Series switch in dotted decimal notation.	192.168.1.1
IP Subnet Mask	Your VES-1000 Series switch automatically calculates the subnet mask based on the IP address that you assign. Unless you are implementing subnetting, use the subnet mask computed by the VES-1000 Series switch.	255.255.255.0
Default Gateway	Enter the IP address of the default outgoing gateway in dotted decimal notation.	192.168.1.254
When you have completed this menu, press [ENTER] at the prompt “Press ENTER to Confirm…” to save your configuration, or press [ESC] at any time to cancel.		

Chapter 5 Port Setup

Configure your VDSL and Ethernet ports in SMT menu 6.

5.1 Configured Vs. Actual VDSL Port Speed

Configure the maximum speed of an individual VDSL port in this menu. Due to noise and other factors on the line, the actual speed may not reach the maximum that you specify. See *Table 4-C VDSL Mode, Frequency Ranges and Speeds* for the range of speeds you may configure for each VDSL mode.

Enter 6 from the main menu to bring up **Menu 6 – Ports Setup.**

```
                    Menu 6 - Ports Setup

      Type       Active   User Name
 1. VDSL         Yes      JoeSoap
 2. VDSL         Yes      David
 3. VDSL         Yes      Troy
 4. VDSL         No       John
 5. VDSL         No       ____________
 6. VDSL         No       ____________
 7. VDSL         No       ____________
 8. VDSL         No       ____________
 9. VDSL         No       ____________
10. VDSL         No       ____________
11. VDSL         No       ____________
12. VDSL         No       ____________
13. Ethernet     Yes      Uplink1
14. Ethernet     Yes      Uplink2


Enter selection Number :
```

Figure 5-1 Menu 6 – Ports Setup for VES-1012 Only

5.2 Port Configuration

Port type (VDSL or Ethernet) is labeled under **Type** in menu 6. Enter the port index number to configure it.

This menu only shows the number of ports that are available on your particular VES-1000 Series switch. As an example, the VES-1008 will show eight available ports and the VES-1012 will show twelve available ports.

5.2.1 VDSL Port Configuration

Select a VDSL port and then press [ENTER] to go to the VDSL port setup menu.

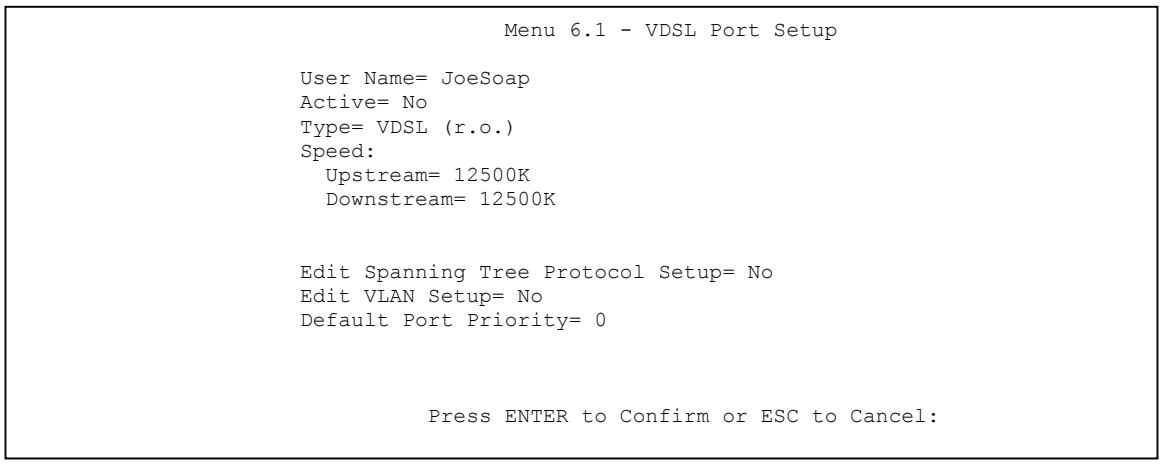


Figure 5-2 VDSL Port Setup

The **Menu 6.1 – VDSL Port Setup** fields are explained in the next table.

Table 5-A VDSL Port Setup

FIELD	DESCRIPTION	EXAMPLE
User Name	Choose a descriptive name for identification purposes. This name can be up to 30 alphanumeric characters long. Spaces are not allowed, but dashes "-" and underscores "_" are accepted.	JoeSoap
Active	The factory default of all VDSL ports is disabled. A port must be enabled for data transmission to occur. Press [SPACE BAR] to select **Yes** and press [ENTER] to enable the specified VDSL port.	**Yes**
Type	This read-only (r.o.) field displays the type of port you are currently configuring. (Ethernet Ports 13 and 14 relate to the VES-1012 only).	**VDSL**
Speed:		
Upstream	Press [SPACE BAR] to cycle through the upstream speeds. Speeds available depend on the **VDSL Mode** chosen in **Menu 2 – Switch Setup**. Please refer to *Table 4-C VDSL Mode,* Frequency Ranges and Speeds.	**9380K**
Downstream	Press [SPACE BAR] to cycle through the downstream speeds available for the **VDSL Mode** chosen in **Menu 2 – Switch Setup**.	**8333K**
Edit Spanning Tree Protocol Setup	Press [SPACE BAR] once to select **Yes** and then press [ENTER] to go to **Menu 6.1 - Port Spanning Tree Protocol Setup.** You must enable STP on the switch (in menu 2) before you configure it on a port(s). Note that you very rarely need to enable STP on VDSL ports since the VDSL ports are directly connected to the users.	**No**
Edit VLAN Setup	Press [SPACE BAR] once to select **Yes** and then press [ENTER] to open **Menu 6.1.3 — Port VLAN Setup**.	**No**
Default Port Priority	The **Default Port Priority** value is added to incoming frames without a (802.1p) priority tag. The default is **0**. Use this field to define the default priority of each port.	0
When you have completed this menu, press [ENTER] at the prompt "Press ENTER to Confirm…" to save your configuration, or press [ESC] at any time to cancel.		

5.2.2 Ethernet Port Setup

Ethernet port connections can be half duplex or full duplex. The Ethernet port must use the same speed / duplex mode setting as the peer Ethernet port in order to connect.

Please refer to *section 2.4.3* for Ethernet port default settings and *section 4.2.3* for information on port trunking.

Select an Ethernet port and then press [ENTER] to go to the Ethernet port setup menu.

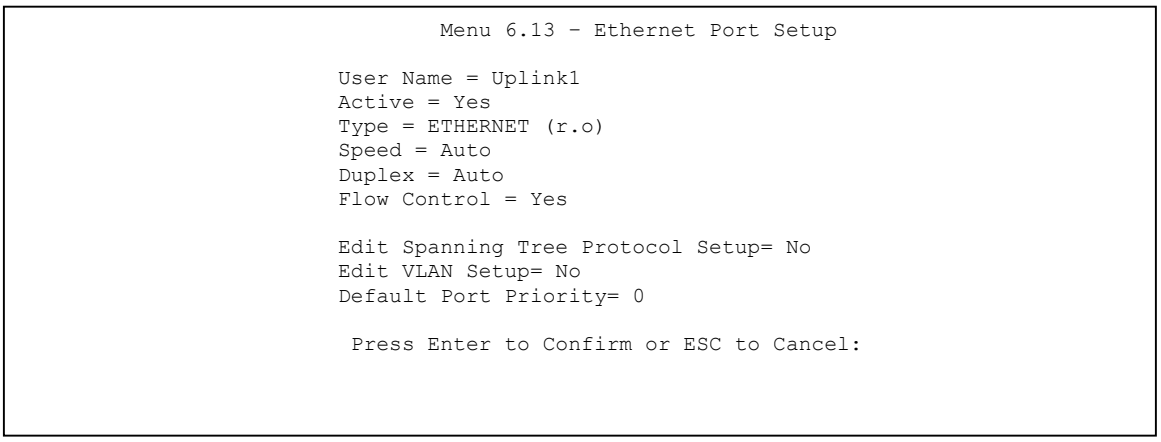

Menu 6.13 – Ethernet Port Setup
User Name = Uplink1
Active = Yes
Type = ETHERNET (r.o)
Speed = Auto
Duplex = Auto
Flow Control = Yes
Edit Spanning Tree Protocol Setup= No
Edit VLAN Setup= No
Default Port Priority= 0
Press Enter to Confirm or ESC to Cancel:

Figure 5-3 Menu 6.13 – Ethernet Port Setup

The **Menu 6.13 – VDSL Port Setup** fields are explained in the next table.

Table 5-B Menu 6.13 – Ethernet Port Setup

FIELD	DESCRIPTION	EXAMPLE
User Name	Choose a descriptive name for identification purposes. This name can be up to 30 alphanumeric characters long. Spaces are not allowed, but dashes "-" and underscores "_" are accepted.	Uplink1
Active	Press [SPACE BAR] to select **Yes** or **No** and press [ENTER] to enable or disable the specified Ethernet port.	**Yes**
Type	This read-only (r.o.) field displays the type of port you are currently configuring. (Ethernet ports 13 & 14 relate to the VES-1012 switch only).	Ethernet
Speed	Set Ethernet transmission speed (10 or 100 Mbps) in this field. The VES-1000 Series switch automatically finds the speed of the attached device if you select **Auto**; otherwise check the settings of the device attached to this port and configure the same settings here. Press [SPACE BAR] to select from **Auto**, **100M** or **10M** and then press [ENTER].	**Auto**
Duplex	Set Ethernet duplex mode (full-duplex or half-duplex) in this field. The VES-1000 Series switch automatically finds the mode of the attached device if you select **Auto**; otherwise check the settings of the device attached to this port and configure the same settings here. Press [SPACE BAR] to select from **Auto**, **Full** or **Half** and then press [ENTER].	**Auto**
Flow Control	Enable or disable flow control on the Ethernet port in this field. Press [SPACE BAR] to select either **Enable** or **Disable.**	**Enable**
Edit Spanning Tree Protocol	Press [SPACE BAR] once to select **Yes** and then press [ENTER] to go to **Menu 6.1 - Port Spanning Tree Protocol Setup.** You must enable STP	**No**

Table 5-B Menu 6.13 – Ethernet Port Setup

FIELD	DESCRIPTION	EXAMPLE
Edit Spanning Tree Protocol Setup	Press [SPACE BAR] once to select **Yes** and then press [ENTER] to go to **Menu 6.1 - Port Spanning Tree Protocol Setup.** You must enable STP on the switch (in menu 2) before you configure it on a port(s).	**No**
Edit VLAN Setup	Press [SPACE BAR] once to select **Yes** and then press [ENTER] to open **Menu 6.1.3 — Port VLAN Setup**.	**No**
Default Port Priority	The **Default Port Priority** value is added to incoming frames without a (802.1p) priority tag. The default is **0**. Use this field to define the default priority of each port.	0
When you have completed this menu, press [ENTER] at the prompt "Press ENTER to Confirm…" to save your configuration, or press [ESC] at any time to cancel.		

5.3 Configuring STP on a Port

You must enable STP on the switch (in menu 2) before you configure it on a port(s).

Enter 6 from the main menu and then choose a port to configure by entering its index number. Go to the **Edit Spanning Tree Protocol Setup** field, press [SPACE BAR] once to select **Yes** and then [ENTER] to go to **Menu 6.1 - Port Spanning Tree Protocol Setup**.

```
                        Menu 6.1 - Port Spanning Tree Protocol Setup

                          Spanning Tree Protocol:
                            Active= No
                            Priority= 128
                            Path Cost= 100


                          Press ENTER to Confirm or ESC to Cancel:

        Press Space Bar to Toggle.
```

Figure 5-4 Menu 6.1 - Port Spanning Tree Protocol Setup

Table 5-C Menu 6.1 - Port Spanning Tree Protocol Setup

FIELD	DESCRIPTION	EXAMPLE
Spanning Tree Protocol:	Configure the next three fields to use STP on this port. Make sure that STP is enabled on the device (see *section4.2.4*).	
Active	Press [SPACE BAR] once to select **Yes** to enable the Spanning Tree Protocol.	No
Priority	Configure the priority for each port here. Priority decides which port should be disabled when more than one port form a loop in a switch. Ports with a higher numeric priority value are disabled first. The allowed range is between 0 and 255 and the default value is 128.	128 (default)
Path Cost	Path cost is the cost of transmitting a frame onto a LAN through that port. It is assigned according to the speed of the media. The slower the media, the higher the cost. *See Table 4-D Path Cost*.	

5.3.1 Configuring VLAN on a Port

Select **Yes** in the **Edit VLAN Setup** field in **Menu 6.1 — VDSL Port Setup** (or **Menu 6.13 — Ethernet Port Setup)** to open **Menu 6.1.3 — Port VLAN Setup**.

```
                    Menu 6.1.3 - Port VLAN Setup

Default VLAN ID= 1
VLAN Acceptable Frame Type= All

GVRP= Disable


Press ENTER to Confirm or ESC to Cancel:
```

Figure 5-5 Menu 6.1.3 Port VLAN Setup

Table 5-D Menu 6.1.3 - Port VLAN Setup

FIELD	DESCRIPTION	EXAMPLE
Default VLAN ID	Default VLAN ID is the PVID (Port VLAN ID) assigned to untagged frames or priority frames (frames with null (0) VID) received on this port. The default is 1 (*see section4.2.8*).	1(default)
VLAN Acceptable Frame Type	Choose **All** if you want the port to accept both tagged and untagged incoming packets (to that port). Choose **Tagged** if you want the port to accept just tagged incoming packets (to that port). See *section 4.2.8* for more information on tagged and untagged frames.	**All** (default)
GVRP	GVRP (GARP VLAN Registration Protocol) is a registration protocol that defines a way for switches to register VLAN members on ports across the network. Enable this function to propagate VLANs information beyond the local switch. Press [SPACE BAR] once to select **Enable** and then [ENTER] to permit GVRP on this port.	**Disable** (default)
Once you have completed filling in **Menu 6.1.3 — Port VLAN Setup**, press [ENTER] at the message “Press ENTER to Confirm… “ to save your configuration or press [ESC] at any time to cancel.		

Part III:

Advanced Applications and Management

This part shows you how to configure static routes and SNMP.

Chapter 6
Static Route Setup

Static routes tell the VES-1000 Series switch how to forward management traffic.

6.1 Creating a Static Route

Enter 12 from the main menu to go to **Menu 12 – Static Route Setup.**

```
                    Menu 12 - Static Route Setup

                         1. ____________
                         2. ____________
                         3. ____________
                         4. ____________
                         5. ____________
                         6. ____________
                         7. ____________
                         8. ____________

                  Enter selection number:
```

Figure 6-1 Menu 12 – Static Route Setup

Choosing a static route to edit displays the following screen.

```
                  Menu 12.1 — Edit IP Static Route

                        Route #: 1
                        Route Name= ?
                        Active= No
                        Destination IP Address= ?
                        IP Subnet Mask= ?
                        Gateway IP Address= ?
                        Metric= 2


      Press ENTER to Confirm or ESC to Cancel:
```

Figure 6-2 Menu 12.1 - Edit IP Static Route

The following table describes the fields for **Menu 12.1 - Edit IP Static Route Setup**.

Table 6-A Edit IP Static Route Menu Fields

FIELD	DESCRIPTION	EXAMPLE
Route #	This is the index number of the route as listed in **Menu 12 — IP Static Route Setup**.	
Route Name	Enter a descriptive name for this route. This is for identification purpose only.	
Active	This field allows you to activate/deactivate this static route.	**Yes**
Destination IP Address	This parameter specifies the IP network address of the final destination. Routing is always based on network number. If you need to specify a	

Table 6-A Edit IP Static Route Menu Fields

FIELD	DESCRIPTION	EXAMPLE
Destination IP Address	This parameter specifies the IP network address of the final destination. Routing is always based on network number. If you need to specify a route to a single host, use a subnet mask of 255.255.255.255 in the subnet mask field to force the network number to be identical to the host ID.	
IP Subnet Mask	Enter the subnet mask for this destination. Follow the discussion on IP subnet mask in this chapter.	
Gateway IP Address	Enter the IP address of the gateway. The gateway is an immediate neighbor of your VES-1000 Series switch that forwards the packet to the destination. The gateway must be a router on the same segment as your VES-1000 Series switch.	
Metric	The metric represents the “cost” of transmission for routing purposes. IP routing uses hop count as the measurement of cost, with a minimum of 1 for directly connected networks. Enter a number that approximates the cost for this link. The number need not be precise, but it must be between 1 and 15. In practice, 2 or 3 is usually a good number.	**1 to 15**
When you have completed this menu, press [ENTER] at the prompt “Press ENTER to Confirm…” to save your configuration, or press [ESC] at any time to cancel.		

Chapter 7
VLAN Setup

This chapter shows you how to set up VLAN on the switch using SMT menu 17.

7.1 Introduction

To activate IEEE 802.1Q on the VES-1000 Series switch, you must enable it for the switch in menu 2, the port in menu 6 port submenu(s) and menu 17 VLAN setup. Menu 17 allows you to enable GVRP on the switch and configure static VLANs. See elsewhere in this manual for VLAN configuration using menus 2 and 6.

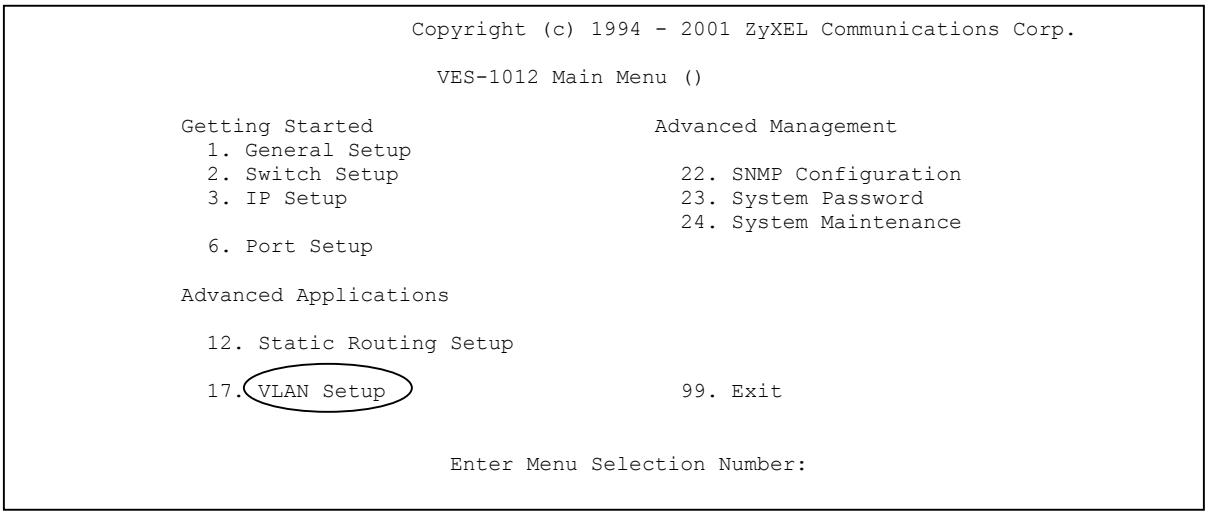


Figure 7-1 Main Setup Menu

7.2 VLAN Setup Configuration

Step 1. Select **802.1Q** as the **VLAN Type** in **Menu 2 — Switch Setup**.

Step 2. Enter 17 from the main menu to go to **Menu 17 — VLAN Setup**.

This menu is not available (Menu 17 – VLAN Setup (N/A)**) if you have *not* selected** 802.1Q **as the VLAN type in** Menu 2 – Switch Setup.

```
                    Menu 17 - VLAN Setup

          GVRP= Disable
          Management VLAN ID= 1
          Edit 802.1Q VLAN Static Entry= No

          Press ENTER to Confirm or ESC to Cancel:
```

Figure 7-2 Menu 17 VLAN Setup

Table 7-A Menu 17 - VLAN Setup

FIELD	DESCRIPTION	EXAMPLE
GVRP	GVRP (GARP VLAN Registration Protocol) is a registration protocol that defines a way for switches to register necessary VLAN members on ports across the network. Enable this function to permit VLANs groups beyond the local switch. Press [SPACE BAR] once to select **Enable** and then [ENTER] to permit GVRP on this port.	**Enable**
Management VLAN ID	Management VLAN ID is the VLAN ID of the CPU and is used for management only. The default is "1". All ports, by default, are fixed members (see **Menu 17.1.1 - 802.1Q VLAN Static Entry Setup**) of this "management VLAN" in order to manage the device from any port. If a port (VDSL or Ethernet) is not a member of this VLAN, then users on that port cannot access the device. To access the device make sure the port that you connected to is a member of Management VLAN.	1 (default)
Edit 802.1Q VLAN Static Entry	Press [SPACE BAR] once to select **Yes** and then [ENTER] to open **Menu 17.1 - 802.1Q VLAN Static Entry Setup** to edit static VLANs.	**No**
Once you have completed filling in Menu 6.1.3 – Port VLAN Setup, press [ENTER] at the message “Press ENTER to Confirm…“ to save your configuration or press [ESC] at any time to cancel.		

7.2.1 Static VLAN Setup

Go to the **Edit 802.1Q VLAN Static Entry** field in **Menu 17 — VLAN Setup** and select **Yes** to open **Menu 17.1 — 802.1Q VLAN Static Entry**. Menu 17.1 shows all defined static VLANs.

Enter the index of the static entry you wish to configure to open **Menu 17.1.1 - 802.1Q VLAN Static Entry Setup**. **Menu 17.1.1** allows you configure a static entry.

```
                Menu 17.1.1 - 802.1Q VLAN Static Entry Setup

     Name= PVID-1
     VLAN ID= 1
     Active= Yes

     Port01= Fixed-U        Port06= Fixed-U        Port11= Fixed-U
     Port02= Fixed-U        Port07= Fixed-U        Port12= Fixed-U
     Port03= Fixed-U        Port08= Fixed-U        Port13= Fixed-U
     Port04= Fixed-U        Port09= Fixed-U        Port14= Fixed-U
     Port05= Fixed-U        Port10= Fixed-U

     Trunk1= N/A

          Press ENTER to Confirm or ESC to Cancel:
```

Figure 7-3 Menu 17.1.1 - 802.1Q VLAN Static Entry Setup

Table 7-B Menu 17.1.1 - VLAN Static Entry Setup

FIELD	DESCRIPTION
Name	Enter a descriptive name (up to 12 characters) for the static VLAN for identification purposes; for example, “marketing” (without the quotes).
VLAN ID	Enter the VLAN ID for this static entry; the valid range is between 1 and 4094.
Active	Press [SPACE BAR] once to select **Yes** and then [ENTER] to activate this static entry.
Port01 ~ Port14	Press [SPACE BAR] to choose from **Fixed-U**, **Fixed-T**, **Forbidden, Normal-U** or **Normal-T**. The abbreviations are defined as follows. **Fixed-U** Fixed Registration + Untagged **Fixed-T** Fixed Registration + Tagged **Forbidden** Forbidden Registration **Normal-U** Normal Registration + Untagged **Normal-T** Normal Registration + Tagged
Trunk1	Press [SPACE BAR] to choose from **Fixed-U**, **Fixed-T**, **Forbidden, Normal-U** or **Normal-T**.
Once you have completed filling in **Menu 17.1.1 — 802.1Q VLAN Static Entry Setup**, press [ENTER] at the message “Press ENTER to Confirm… “ to save your configuration or press [ESC] at any time to cancel.	

Tagged and Untagged governs the outgoing frames. Fixed/forbidden/normal governs VLAN registration.

Note that care must be taken when configuring VLAN for the management port; if the configuration is not correct, it will render the VES-1000 Series Switch unreachable from the remote management station. The following are guidelines for tagged VLAN configuration:

- Reserve one VID specifically for management purpose. Assign that VID to be the management VLAND ID.
- Make sure the member set of the management VID includes the uplink port through which the management station talks to the VES. If you don’t know which uplink port it is, include both uplink ports in the member set of the management VID. It generally does no harm in doing this, since typically both uplink ports talk to each other already.

- Save the configuration only after you configure both the management VLAN ID and the member set of that VID consistently. Otherwise, the VES-1000 Series will be unreachable in-band through the uplink ports, since the traffic will be blocked by the inconsistent VLAN setting.
- PC and Workstations generally do not support tagged VLAN. If the management station indeed does not support tagged VLAN, you must connect it to a VLAN-aware switch and configure the PVID of the port connected to the management station to be the management VID.

Chapter 8
SNMP Configuration

This chapter discusses SNMP (Simple Network Management Protocol) for network management and monitoring.

8.1 About SNMP

Simple Network Management Protocol is a protocol used for exchanging management information between network devices. SNMP is a member of TCP/IP protocol suite. Your VES-1000 Series switch supports SNMP agent functionality, which allows a manager station to manage and monitor the VES-1000 Series switch through the network. The VES-1000 Series switch supports SNMP version one (SNMPv1). The next figure illustrates an SNMP management operation. SNMP is only available if TCP/IP is configured.

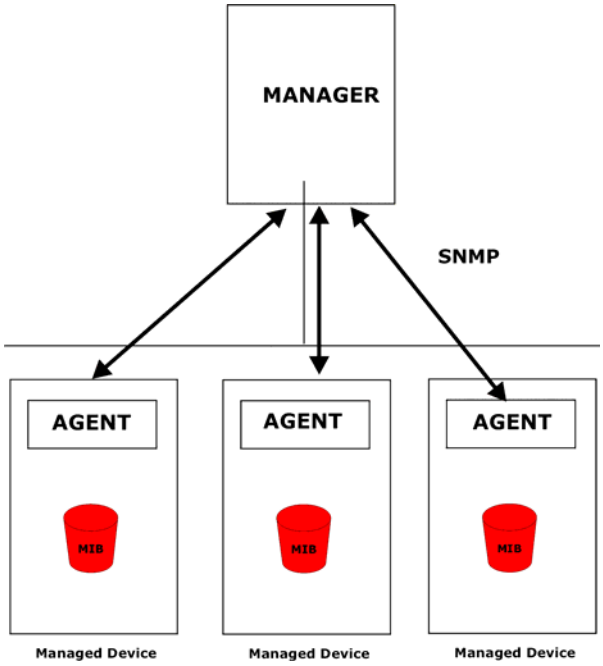


Figure 8-1 SNMP Management Model

An SNMP managed network consists of two main components: agents and a manager.

An agent is a management software module that resides in a managed device (the VES-1000 Series switch). An agent translates the local management information from the managed device into a form compatible with SNMP. The manager is the console through which network administrators perform network management functions. It executes applications that control and monitor managed devices.

The managed devices contain object variables/managed objects that define each piece of information to be collected about a device. Examples of variables include such as number of packets received, node port status etc.

A Management Information Base (MIB) is a collection of managed objects. SNMP allows a manager and agents to communicate for the purpose of accessing these objects.

SNMP itself is a simple request/response protocol based on the manager/agent model. The manager issues a request and the agent returns responses using the following protocol operations:

Table 8-A SNMP Commands

COMMAND	DESCRIPTION
Get	Allows the manager to retrieve an object variable from the agent.
GetNext	Allows the manager to retrieve the next object variable from a table or list within an agent. In SNMPv1, when a manager wants to retrieve all elements of a table from an agent, it initiates a Get operation, followed by a series of GetNext operations.
Set	Allows the manager to set values for object variables within an agent.
Trap	Used by the agent to inform the manager of some events.

8.2 Supported MIBs

VES-1000 Series switches support MIB II (defined in RFC-1213 and RFC-1215). The VES-1000 Series switch can also respond with specific data from the ZyXEL private MIBs (zyxel.mib and zyxel-AS.mib). MIBs let administrators collect statistics and monitor status and performance.

8.3 Configuring SNMP

To configure SNMP, enter 22 from the main menu to open **Menu 22 — SNMP Configuration**, as shown in the next figure. The "community" for **Get**, **Set** and **Trap** fields is simply SNMP's terminology for password.

```
                Menu 22 — SNMP Configuration


              SNMP:
                Get Community= public
                Set Community= public
                Trusted Host= 0.0.0.0
                Trap:
                  Community= public
                   Destination= 0.0.0.0

          Press ENTER to Confirm or ESC to Cancel:
```

Figure 8-2 Menu 22 - SNMP Configuration

The following table describes the SNMP configuration parameters.

Table 8-B SNMP Configuration Menu Fields

FIELD	DESCRIPTION	DEFAULT
Get Community	Enter the get community, which is the password for the incoming Get- and GetNext- requests from the management station.	public (default)
Set Community	Enter the set community, which is the password for incoming Set-requests from the management station.	public (default)

Table 8-B SNMP Configuration Menu Fields

FIELD	DESCRIPTION	DEFAULT
Trusted Host	If you enter a trusted host, your VES-1000 Series switch will only respond to SNMP messages from this address. If you leave the field set to 0.0.0.0 (default), your VES-1000 Series switch will respond to all SNMP messages it receives, regardless of source.	0.0.0.0 (default)
Trap: Community	Enter the trap community, which is the password sent with each trap to the SNMP manager.	public (default)
Trap: Destination	Enter the IP address of the station to send your SNMP traps to.	0.0.0.0 (default)
Once you have completed filling in **Menu 22 — SNMP Configuration**, press [ENTER] at the message "Press ENTER to Confirm…" to save your configuration, or press [ESC] to cancel.		

8.4 SNMP Traps

The VES-1000 Series switch sends traps to an SNMP manager when an event occurs. SNMP traps supported are outlined in the following table.

Table 8-C SNMP Traps

GENERIC TRAP	SPECIFIC TRAP	DESCRIPTION
0 (Cold Start)	0	This trap is sent when the VES-1000 Series switch is turned on.
1 (WarmStart)	0	This trap is sent when the VES-1000 Series switch restarts.
2 (linkDown)	0	This trap is sent when the Ethernet or VDSL link is down.
3 (linkUp)	0	This trap is sent when the Ethernet or VDSL link is up.
4 (authenticationFailure)	0	This trap is sent when an SNMP request comes from non-authenticated hosts.
6 (enterpriseSpecific)	1(TRAP_REBOOT)	This trap is sent when the system is going to reboot. The trap displays the reason for the reboot.
	2 (TRAP_SYSTEMSHUTDOWN)	This trap is sent when the system is going to shut down. The trap displays the reason for the shutdown.
	3 (TRAP_OVERHEAT)	This trap is sent when the temperature exceeds the threshold of 65 degrees centigrade. For example, the following trap shows that the current reading at Temp1 is 68 degrees centigrade. "Temp1 exceeds Limit (Limit = 65 degree C, Read = 68 degree C)"

Table 8-C SNMP Traps

GENERIC TRAP	SPECIFIC TRAP	DESCRIPTION
	4 (TRAP_OVERHEATOVER)	This trap is sent when the temperature returns to normal. For example, the following trap shows that the current reading at Temp1 is 64 degrees centigrade. "Temp1 back to Normal (Limit = 65 degree C, Read = 64 degree C)"
	5 (TRAP_ERRLOG)	This trap is sent when an error log is recorded in the system. The trap includes the content of the error log.
	6 (TRAP_FANRPMLOW)	This trap is sent when the fan speed falls below 4000 RPM (“Limit”, the minimum speed allowed). For example, the following trap shows that the current reading at FAN 1 is 3800 RPM. "FAN1 exceeds Limit (Limit = 4000 RPM, Read = 3800 RPM)"
	7 (TRAP_FANRPMNORMAL)	This trap is sent when the fan speed returns to normal. For example, the following trap shows that the current reading at FAN 1 is 5500 RPM. "FAN1 back to Normal (Limit = 4000 RPM, Read = 5500 RPM)"
	8 (TRAP_VOLTAGELOW)	This trap is sent when the voltage falls out of the tolerance range. For example, the following trap shows that the current reading at the 3.3V sensor is 3.00V, the upper voltage limit is 3.36V and the lower voltage limit is 3.10V. "Power 3.3V exceeds Limit (Up Limit = 3.36V, Down Limit = 3.10V, Read = 3.00V)"
	9 (TRAP_POWENORMAL)	This trap is sent when the voltage returns to normal. For example, the following trap shows that the current reading at the 3.3V sensor is 3.20V, the upper voltage limit is 3.36V and the lower voltage limit is 3.10V. "Power 3.3V back to Normal (Up Limit = 3.36V, Down Limit = 3.10V, Read = 3.20V)"

Part IV:

System Maintenance

This part shows you how to configure SMT menu 24 and submenus including CI commands.

Chapter 9
System Maintenance 1

This chapter discusses the System Status, System Information and Console Port Speed, Log and Trace and Diagnostic SMT menus.

9.1 Introduction

Select 24 in the main menu to open **Menu 24 – System Maintenance**, as shown next.

```
                Menu 24 — System Maintenance

                1. System Status
                2. System Information and Console Port Speed
                3. Log and Trace
                4. Diagnostic
                5. Backup Configuration
                6. Restore Configuration
                7. Upload Firmware
                8. Command Interpreter Mode

               10. Time and Date Setting
               11. Remote Management Control
               12. Hardware Monitor


                Enter Menu Selection Number:
```

Figure 9-1 Menu 24 – System Maintenance

9.2 System Status

System status is a tool that can be used to monitor your VES-1000 Series switch. System maintenance gives you information on your system firmware version and the status/statistics of the ports. Similarly, Spanning Tree Protocol Status and VLAN Status display STP and VLAN information

```
                      Menu 24.1 - System Status

                1. System Maintenance
                2. Spanning Tree Protocol Status
                3. VLAN Status



                Press ENTER to Confirm or ESC to Cancel:
```

Figure 9-2 Menu 24.1 – System Status

9.2.1 System Maintenance

Step 1. Enter 24 from the main menu to go to **Menu 24 – System Maintenance**.

Step 2. Enter 1 to open **Menu 24.1 – System Status**.

Step 3. Enter 1 again to open **Menu 24.1.1 — System Maintenance — System Status.**

```
                Menu 24.1 — System Maintenance — System Status

  Port    Link       State       TxPkts    RxPkts    Errs    Tx(KB/s)    Rx(KB/s)     Up Time

   > 1    18M/16M    FWD        1636800    636352       4         473          10      7:46:10
     2    18M/16M    FWD        3023504         0       0           8           0     22:24:04
     3    Down       STOP             0         0       0           0           0      0:00:00
     4    18M/16M    FWD        3093495     55529       0           8           0     22:24:04
     5    Down       STOP             0         0       0           0           0      0:00:00
     6    Down       STOP             0         0       0           0           0      0:00:00
     7    18M/16M    FWD        3036539     26460       0           8           0     22:23:51
     8    18M/16M    FWD        3041121     16886       0           8           0     22:24:00
     9    18M/16M    FWD        3017116         0       0           8           0     22:24:03
    10    18M/16M    FWD         109882         0       0           8           0      0:55:56
    11    12M/16M    FWD        3029325     11669       0           6           0     22:24:02
    12    18M/16M    FWD         607588        30       0           6           0      5:20:06
    13    100M/F     FWD        1051300   10710950       1          11         508     72:07:19
    14    100M/F     FWD         246459    9990813       0           0          10     72:07:19

                                  Press Command:
   COMMANDS:  a-Reset All  b-Reset  d-Drop  i-UP  j-Down  p-Detail  ESC-Exit
```

Figure 9-3 Menu 24.1 – System Maintenance – System Status

Figure 9-3 shows the menu screen for the VES-1012 Ethernet switch. The same screen for the VES-1008 will show Ports 1-10

The following table describes the fields present in **Menu 24.1 – System Maintenance – Status**.

Table 9-A System Maintenance – Status Menu Fields

FIELD	DESCRIPTION
Port	This refers to the VDSL or Ethernet port number. The cursor (“>“) next to a port marks the current selected port (see commands ahead).
Link	This field shows whether the VDSL or Ethernet connection is down, the upstream/downstream speeds of the VDSL connections and the speed/duplex mode of the Ethernet connections.
State	This field shows training state of the ports. The states are **FWD** (forwarding), which means the link is functioning normally or **STOP** (the port is stopped to break a loop or duplicate path).
TxPkts	This field shows the number of transmitted packets on this port.
RxPkts	This field shows the number of received packets on this port.
Errs	This field shows the number of received errors on this port.
Tx KB/s	This field shows the number of bytes transmitted on a per-second basis in kilobytes per second on this port.
Rx KB/s	This field shows the number of bytes received on a per-second basis in kilobytes per second on this port.

Table 9-A System Maintenance – Status Menu Fields

FIELD	DESCRIPTION
Up Time	This field shows the total amount of time the line has been up.
Commands	
a	Press ‘a’ to reset all the counters in this screen.
b	Press ‘b’ to reset the counters for a specific port (port marked by “>”).
d	Press ‘d’ to drop a specific port (port marked by “>”).
i	Press ‘i’ to forcibly bring up a specific port (port marked by “>”).
j	Press ‘j’ to forcibly drop a specific port (port marked by “>”).
p	Press “p” to view port details as shown in the next screen.
ESC	Press [ESC] to return to menu 24.

Port Statistics

Press “p” in **Menu 24.1 – System Maintenance – System Status** to view port details as shown in the next screen.

```
Port 2 statics:
 RxUcstPkts    =98529      RxBcstPkts    =2          RxMcstPkts    =0
 RxPausePkts   =0          RxFCSErrors   =0          Collisions0   =98630
 Collisions1   =0          MultiCollision=0          TxUcstPkts    =98535
 TxBcstPkts    =93         TxMcstPkts    =3          TxPausePkts   =0
 FloodPkts     =0          FilterPkts    =0          BufFullDrops  =0
 StormDrops    =0          Rx64Octets    =2          Rx65To127     =32845
 Rx128To255    =0          Rx256To511    =0          Rx512To1023   =0
 Rx1024ToMAX   =65690      TxExcessCOLs  =0          TxLateCOLs    =0
 Tx64Bytes     =5          Tx65To127     =32895      Tx128To255    =13
 Tx256To511    =33         Tx512To1023   =0          Tx1024ToMAX   =65690
 RxOctetsMSB   =0          RxOctetsLSB   =102545340  TxOctetsMSB   =0
 TxOctetsLSB   =102565243  RxFragments   =0          RxJabbers     =0
 RxAlignErrors =0          RxSymbolErrors=0          SecurityDrops =0
 VLANDrops     =0          UndersizedPkt =0          OversizedPkt  =0
 TxOversizePkt =0
VDSL Upstream Status:
  Constellation =  QAM 256/Int 32, Rate =  6250000 bps, Fc = 4467773 Hz
  SNR = 37.93dB MSE = 15.33dB PSD = -78.82dBm/Hz RSERR = 0       DISC = 0
VDSL Downstream Status:
  Constellation =  QAM 256/Int 12, Rate = 16666666 bps, Fc = 1953125 Hz
  SNR = 43.01dB MSE = 20.41dB PSD = -57.00dBm/Hz RSERR = 0       DISC = 0
Press any key to return:
```

Figure 9-4 Port Statistics

Table 9-B Port Statistics

FIELD	DESCRIPTION
RxUcstPkts	Number of good unicast frames received.
RxBcstPkts	This is the number of good broadcast frames received.
RxMcstPkts	This is the number of good multicast frames received.
RxPausePkts	This is the number of 802.3x pause frames received.
RxFCSErrors	This is the number of frames received of the proper size but with CRC error and non-

Table 9-B Port Statistics

FIELD	DESCRIPTION
	integral number of octets.
Collisions0	This is the number of frames in which the transmission process experienced no collisions.
Collisions1	This is the number of frames in which the transmission process experienced one collision.
MultiCollision	This is the number of frames in which the transmission process experienced two to fifteen collisions.
TxUcstPkts	This is the number of good unicast frames transmitted.
TxBcstPkts	This is the number of good broadcast frames transmitted.
TxMcstPkts	This is the number of good multicast frames transmitted.
TxPausePkts	This is the number of 802.3x pause frames transmitted.
FloodPkts	This is the number of good frames that were flooded, i.e., sent to every port, by the switch due to unknown destinations.
FilterPkts	This is the number of good frames that were filtered by the switch.
BufFullDrops	This is the number of packets the switch discarded due to full memory.
StormDrops	This is the number of broadcast packets discarded by the switch.
Rx64Octets	This is the number of frames (including bad frames) received that were 64 octets in length.
Rx65To127	This is the number of frames (including bad frames) received that were between 65 and 127 octets in length.
Rx128To255	This is the number of frames (including bad frames) received that were between 128 and 255 octets in length.
Rx256To511	This is the number of frames (including bad frames) received that were between 256 and 511 octets in length.
Rx512To1023	This is the number of frames (including bad frames) received that were between 512 and 1023 octets in length.
Rx1024ToMAX	This is the number of frames (including bad frames) received that were between 1024 and above in length.
TxExcessCOLs	This is the number of times in which the transmission fails due to excessive collisions.
TxLateCOLs	This is the number of times a collision is detected later than 512 bit time into the frame transmission.
Tx64Bytes	This is the number of frames (including bad frames) transmitted that were 64 octets in length.
Tx65To127	This is the number of frames (including bad frames) transmitted that were between 65 and 127 octets in length.
Tx128To255	This is the number of frames (including bad frames) transmitted that were between 128 and 255 octets in length.
Tx256To511	This is the number of frames (including bad frames) transmitted that were between 256 and 511 octets in length.
Tx512To1023	This is the number of frames (including bad frames) transmitted that were between 512 and 1023 octets in length.
Tx1024ToMAX	This is the number of frames (including bad frames) transmitted that were between 1024

Table 9-B Port Statistics

FIELD	DESCRIPTION
	and above in length.
RxOctetsMSB	Upper 32-bit count of the number of received octets of data (including those in bad frames).
RxOctetsLSB	Lower 32-bit count of the number of received octets of data (including those in bad frames).
TxOctetsMSB	Upper 32-bit count of the number of transmitted octets of data (including those in bad frames).
TxOctetsLSB	Lower 32-bit count of the number of transmitted octets of data (including those in bad frames).
RxFragments	This is the number of frames received that were less than 64 octets long and with either a CRC error or an alignment error.
RxJabbers	This is the number of frames received that were greater than the maximum octets (specified for the system by the configuration software) long and with either a CRC error or an alignment error.
RxAlignErrors	This is the number of frames received that were of the proper size but with a CRC error and non-integral number of octets.
RxSymbolErrors	This is the number of frames received that were of the proper size but experienced symbol error during frame reception.
SecurityDrops	This is the number of good frames that were dropped because the violation of the switch security rules.
VLANDrops	This is the number of good frames that were dropped because the specified destination port does not belong to the VLAN domain.
UndersizedPkt	This is the number of frames received that were less than 64 octets long and without any CRC or alignment errors.
OversizedPkt	This is the number of frames received that were greater than the maximum octets (specified for the system by the configuration software) long and without any CRC error or alignment errors.
TxOversizePkt	This is the number of frames transmitted that were greater than the maximum octets (specified for the system by the configuration software) long and without any CRC or alignment errors.
VDSL Upstream/Downstream status	The following parameters apply to both upstream and downstream VDSL.
Constellation	Constellation shows the modulation method and speed. The constellations are QAM 4, QAM 8, QAM 16, QAM 64, QAM 256 where QAM (Quadrature Amplitude Modulation) defines how many bits there are per symbol; for example QAM 4 means 2 bits per symbol (2^2), QAM 8, 3 bits (2^3) per symbol and so on. Int (Interpolation) defines how fast the symbols go through the line. It is equal to 25.0MHz / baud rate, so for example, Int 8 = 25.0 / 8 Mbaud.
Rate	This is the VDSL raw speed.
Fc	This is the carrier frequency
SNR	The higher the SNR (Signal-to-Noise Ratio) number, the better. SNR (Signal-to-Noise

Table 9-B Port Statistics

FIELD	DESCRIPTION
	Ratio is the ratio of the amplitude of the desired signal to the amplitude of noise signals at a given point in time.
MSE	Minimum Square Error. The minimum mean-square error (also known as MMSE) performance measure is a popular metric for optimal signal processing.
RS_ERR	This is the Reed-Solomon error count. Reed-Solomon codes are block-based error correcting codes and are used to correct errors in many systems including
PSD	This is the Power Spectrum Density.
DISC	This is a VDSL Disconnect counter.

9.2.2 Spanning Tree Protocol Status

Verify STP status in this menu.

Step 4. Enter 24 from the main menu to go to **Menu 24 – System Maintenance**.

Step 5. Enter 1 to open **Menu 24.1 – System Status**.

Step 6. Enter 2 to open **Menu 24.1.2 — System Maintenance — Spanning Tree Protocol Status**.

```
                    Menu 24.1.2 - Spanning Tree Protocol Status

Spanning Tree Protocol= Running
Root Bridge:                          Our Bridge:
  Bridge ID: 8000-00a0c5451da7          Bridge ID: 8000-00a0c5451da7
  Cost to Bridge: 0                     Hello Time(Time (sec): 2
  PortID: 0X0000                        Max Age(Age (sec): 20
  Hello Time(Time (sec): 2                    Forward Delay (sec): 15
  Max Age(Age (sec): 20
  Forward Delay(Delay (sec): 15

Topology:
  Change Times: 0
  Time Since Last Change:     0:00:16




                             Press ESC to return:
```

Figure 9-5 Menu 24.1.2 - Spanning Tree Protocol Status

Table 9-C Menu 24.1.2 - Spanning Tree Protocol Status

FIELD	DESCRIPTION
Spanning Tree Protocol	This field shows if the switch is enabled to participate in an STP-compliant network.
Root Bridge	The following six fields relate to the root bridge.
Bridge ID	This is a unique identifier for this bridge, consisting of bridge priority plus MAC address.
Cost to Bridge	This is the cost for a packet to travel to the root in the current Spanning Tree configuration. The slower the media, the higher the cost. This is 0 if your bridge is the root device.

Table 9-C Menu 24.1.2 - Spanning Tree Protocol Status

FIELD	DESCRIPTION
Port ID	This is the index of the port on this switch that is closest to the root. This switch communicates with the root device through this port. This is 0X0000 if your bridge is the root device.
Hello Time	This is the time interval (in seconds) at which the root device transmits a configuration message.
Max Age	This is the maximum time (in seconds) a device can wait without receiving a configuration message before attempting to reconfigure.
Forward Delay	This is the time (in seconds) a device will wait before changing states.
Our Bridge	The following four fields relate to your device. Your device may also be the root bridge.
Bridge ID	This is a unique identifier for this bridge, consisting of bridge priority plus MAC address.
Hello Time	This is the time interval (in seconds) at which the root device transmits a configuration message.
Max Age	This is the maximum time (in seconds) a device can wait without receiving a configuration message before attempting to reconfigure.
Forward Delay	This is the time (in seconds) a device will wait before changing states.
Topology	The next two fields detail STP topology change information.
Change Times	This is the number of times the spanning tree has been reconfigured.
Time Since Last Change	This is the time since the spanning tree was last reconfigured.

9.2.3 VLAN Status

Verify VLAN status in this menu.

Step 7. Enter 24 from the main menu to go to **Menu 24 – System Maintenance**.

Step 8. Enter 1 to open **Menu 24.1 – System Status**.

Step 9. Enter 2 to open **Menu 24.1.3 — VLAN Status**.

```
                          Menu 24.1.3 - VLAN Status

Number of VLANs= 1                          Management VID= 1

 VID   Egress Port       Untagged Port     Elapsed Time  Status
-----  ---------------  ----------------  ------------  -------
    1  EEEEE|EEEEE|EEEE  UUUUU|UUUUU|UUUU      4:15:11   Static


       Press ESC to return,'p' for prev OR 'n' for next page:
```

Figure 9-6 Menu 24.1.3 VLAN Status

Table 9-D Menu 24.1.3 - VLAN Status

FIELD	DESCRIPTION
Number of VLANs	This is the total number of VLANs on the switch.
Management VID	Management VLAN ID is the VLAN ID of the CPU and is used for management only. The default is "1". All ports, by default, are fixed members (see **Menu 17.1.1 - 802.1Q VLAN Static Entry Setup**) of this "management VLAN" so as to manage the device from any port.
VID	This is the VLAN identification number configured in menu 17.1.1)
Egress Port	These are the VLAN member ports. “E” denotes an egress port. The “|” symbol separates every five ports.
Untagged Port	These are the ports that transmit untagged (“U”) egress frames (in this VLAN).
Elapsed Time	This field displays the elapsed time since this VLAN was created.
Status	This field displays whether the VLAN is created dynamically using GVRP or static.

9.3 System Information and Console Port Speed

This section describes your system and allows you to choose different console port speeds. To get to **Menu 24.2 — System Information and Console Port Speed**:

Step 1. Enter 24 to go to **Menu 24 – System Maintenance**.

Step 2. Enter 2 to open **Menu 24.2 – System Information and Console Port Speed**.

Step 10. From this menu you have two choices as shown in the next figure:

```
                Menu 24.2 — System Information and Console Port Speed

                           1. System Information
                           2. Console Port Speed









Please enter selection:
```

Figure 9-7 Menu 24.2 – System Information and Console Port Speed

9.3.1 System Information

System Information gives you information about your system as shown next. These fields are read-only.

```
                Menu 24.2.1 — System Maintenance — Information

                   System Name: VES_APLHA
                   ZyNOS F/W Version: V3.30 (DB.0)b7 | 10/19/2001
                   VDSL Driver Version: 0.52 | 10/11/2001

                   LAN
                     Ethernet Address: 00:a0:c5:00:14:42
                     IP Address: 172.21.10.64
                     IP Mask: 255.255.0.0




                         Press ESC or RETURN to Exit:
```

Figure 9-8 Menu 24.2.1 - System Maintenance – Information

Table 9-E Fields in System Maintenance

FIELD	DESCRIPTION
Name	This is the VES-1000 Series switch system name assigned in menu 1.
ZyNOS F/W Version	This field refers to the version of ZyXEL's Network Operating System.
VDSL Driver Version	This field refers to the version of VDSL driver.
Ethernet Address	This field refers to the Ethernet MAC (Media Access Control) address of the VES-1000 Series switch.
IP Address	This is the IP address of the VES-1000 Series switch in dotted decimal notation.
IP Mask	This shows the IP mask of the VES-1000 Series switch.
Press [ESC] or [ENTER] to exit this menu.	

9.3.2 Console Port Speed

You can change the speed of the console port through **Menu 24.2.2 – System Maintenance – Change Console Port Speed**. Your VES-1000 Series switch supports 9600 (default), 19200, 38400, 57600, and 115200 bps for the console port. Use [SPACE BAR] to select the desired speed.

```
          Menu 24.2.2 – System Maintenance – Change Console Port Speed

    Console Port Speed: 115200




    Press ENTER to Confirm or ESC to Cancel:

    Press Space Bar to Toggle.
```

Figure 9-9 Menu 24.2.2 – System Maintenance – Change Console Port Speed

9.4 Log and Trace

There are two logging facilities in switches in the VES-1000 Series. The first is the error logs and trace records that are stored locally. The second is the UNIX syslog facility for message logging.

9.4.1 Viewing Error Log

The first place you should look for clues when something goes wrong is the error/trace log. Follow the procedures next to view the local error/trace log:

```
                Menu 24.3 — System Maintenance — Log and Trace


                    1. View Error Log
                    2. UNIX Syslog



                            Please enter selection
```

Figure 9-10 Menu 24.3 - System Maintenance - Log and Trace

Step 1. Enter 24 from the main menu to open **Menu 24** – **System Maintenance**.

Step 2. From menu 24, enter 3 to open **Menu 24.3** – **System Maintenance** – **Log and Trace**.

Step 3. Enter 1 from **Menu 24.3** – **System Maintenance** – **Log and Trace** to display the error log in the system.

After the VES-1000 Series switch finishes displaying, you will have the option to clear the error log.

Examples of typical error and information messages are presented in the next figure.

```
  59 Thu Jan  1 00:00:03 1970 PINI  INFO  SMT Session Begin
  60 Thu Jan  1 00:05:11 1970 PINI  INFO  SMT Session End
  61 Thu Jan  1 00:17:59 1970 PINI  INFO  SMT Session Begin
  62 Thu Jan  1 00:24:40 1970 PINI  INFO  SMT Session End
  63 Thu Jan  1 00:35:32 1970 PINI  INFO  SMT Session Begin
Clear Error Log (y/n):
```

Figure 9-11 Examples of Error and Information Messages

9.4.2 UNIX Syslog

The VES-1000 Series switch uses the UNIX syslog facility to log the system messages to a syslog server. UNIX Syslog can be configured in **Menu 24.3.2 – System Maintenance – UNIX Syslog**, as shown next.

Step 1. Enter 24 from the main menu to open **Menu 24** – **System Maintenance**.

Step 2. From menu 24, enter 3 to open **Menu 24.3 – System Maintenance – Log and Trace**.

Step 3. Enter 2 from **Menu 24.3 – System Maintenance – Log and Trace** to display the UNIX syslog menu.

```
            Menu 24.3.2 -- System Maintenance — UNIX Syslog

                     Syslog:
                     Active= No
                     Syslog IP Address= ?
                     Log Facility= Local 1

                     Types:
                     CDR= No
                Press ENTER to Confirm or ESC to Cancel:

   Press Space Bar to Toggle.
```

Figure 9-12 Menu 24.3.2 – System Maintenance – UNIX Syslog

Configure the UNIX syslog parameters described in the following table to activate syslog.

Table 9-F System Maintenance Menu Syslog Parameters

FIELD	DESCRIPTION
Syslog:	
Active	Press [SPACE BAR] to turn on or off syslog.
Syslog IP Address	Enter the IP address of the syslog server .
Log Facility	Press [SPACE BAR] to toggle between the 7 different **Local** options. The log facility allows you to log the message to different files in the server. Please refer to your UNIX manual for more details.
Types:	
CDR	Connection Detail Record (CDR) logs all VDSL connection activity if set to **Yes**.
Once you have completed filling in this menu, press [ENTER] at the message “Press ENTER to Confirm” to save your configuration, or press [ESC] to cancel.	

9.5 Diagnostic

The diagnostic facility allows you to test the different aspects of your VES-1000 Series switch to determine if it is working properly. Menu 24.4 allows you to choose among various types of diagnostic tests to evaluate your system, as shown next.

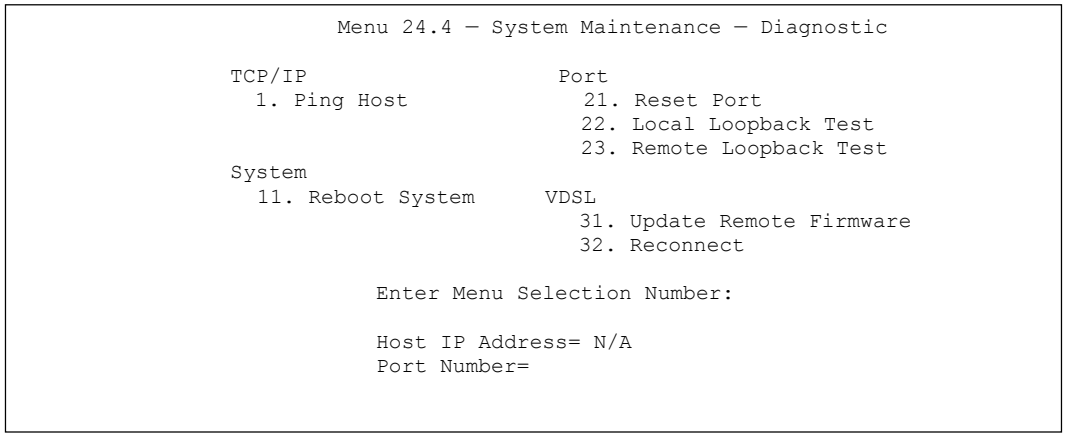


Figure 9-13 Menu 24.4 – System Maintenance – Diagnostic

Follow the procedures next to get to **Menu 24.4** – **System Maintenance – Diagnostic.**

Step 1. From the main menu, enter 24 to open **Menu 24** – **System Maintenance**.

Step 2. From this menu, enter 4. This will open **Menu 24.4** – **System Maintenance** – **Diagnostic**.

The following table describes the diagnostic tests available in menu 24.4 for your VES-1000 Series switch and the connections.

Table 9-G System Maintenance Menu Diagnostic

MENU OPTION	FIELD	DESCRIPTION
TCP/IP		
1	Ping Host	Enter 1 to ping any machine (with an IP address). Enter its IP address in the **Host IP Address** field below.
System		
11	Reboot System	Enter 11 to reboot the VES-1000 Series switch.
Port		
21	Reset Port	Enter 21 and then the port number in the **Port Number** field below to reset the port.
22	Local Loop Back Test	Use these loop back tests to determine if there's a problem with the VES-1000 Series switch or the telephone line to the VDSL modem. Enter 22 and then the port number in the **Port Number** field below to do a local (internal to the switch) loop back test.
23	Remote Loop Back Test	Enter 23 and then the port number in the **Port Number** field below to do a remote (from the switch to the VDSL modem) loop back test.
VDSL		
31	Update Remote Firmware	Enter 31 to manually update the subscriber's VDSL modem firmware; you may also do this automatically in SMT menu 2.
32	Reconnect	Enter 32 to drop and bring up the VDSL connection. You may do this if you are experiencing problems with a subscriber's VDSL connection.
	Host IP Address	If you entered 1 above, then enter the IP address of the machine you want to ping in this field.
	Port Number	If you entered 21, 22 or 23 above, then enter the port number in this field.

Chapter 10 Firmware and Configuration File Maintenance

This chapter tells you how to back up and restore your configuration file as well as upload new firmware and a new configuration file.

10.1 Filename Conventions

The configuration file (often called the romfile or rom-0) contains the factory default settings in the menus such as password, DHCP Setup, TCP/IP Setup, etc. It arrives from ZyXEL with a “rom” filename extension. Once you have customized the VES-1000 Series switch 's settings, they can be saved back to your computer under a filename of your choosing.

ZyNOS (ZyXEL Network Operating System sometimes referred to as the “ras” file) is the system firmware and has a “bin” filename extension. With many FTP and TFTP clients, the filenames are similar to those seen next.

```
ftp> put firmware.bin ras
```

This is a sample FTP session showing the transfer of the computer file " firmware.bin" to the VES-1000 Series switch.

```
ftp> get rom-0 config.cfg
```

This is a sample FTP session saving the current configuration to the computer file “config.cfg”.

If your (T)FTP client does not allow you to have a destination filename different than the source, you will need to rename them as the VES-1000 Series switch only recognizes “rom-0” and “ras”. Be sure you keep unaltered copies of both files for later use.

The following table is a summary. Please note that the internal filename refers to the filename on the VES-1000 Series switch and the external filename refers to the filename not on the VES-1000 Series switch, that is, on your computer, local network or FTP site and so the name (but not the extension) may vary. After uploading new firmware, see the **ZyNOS F/W Version** field in **Menu 24.2.1 — System Maintenance — Information** to confirm that you have uploaded the correct firmware version. The AT command is the command you enter after you press “y” when prompted in the SMT menu to go into debug mode.

Table 10-A Filename Conventions

FILE TYPE	INTERNAL NAME	EXTERNAL NAME	DESCRIPTION
Configuration File	Rom-0	*.rom	This is the configuration filename on the VES-1000 Series switch. Uploading the rom-0 file replaces the entire ROM file system, including your VES-1000 Series switch configurations, system-related data (including the default password), the error log and the trace log.
Firmware	Ras	*.bin	This is the generic name for the ZyNOS firmware on the VES-1000 Series switch.

10.2 Backup Configuration

The VES-1000 Series switch displays different messages explaining different ways to backup, restore and upload files in menus 24.5, 24.6, 24. 7.1 and 24.7.2; depending on whether you use the console port or Telnet.

Option 5 from **Menu 24 — System Maintenance** allows you to backup the current configuration to your computer for your VES-1000 Series switch. Backup is highly recommended once your VES-1000 Series switch is functioning properly. FTP is the preferred methods for backing up your current configuration to your computer since they are faster. You can also perform backup and restore using menu 24 through the console port. Any serial communications program should work fine; however, you must use Xmodem protocol to perform the download/upload and you don't have to rename the files (see *section 10.1*).

Please note that terms "download" and "upload" are relative to the computer. Download means to transfer from the VES-1000 Series switch to the computer, while upload means from your computer to the VES-1000 Series switch.

10.2.1 Backup Configuration

Follow the instructions as shown in the next screen.

```
              Menu 24.5 — System Maintenance — Backup Configuration

To transfer the configuration file to your workstation, follow the procedure
below:

1. Launch the FTP client on your workstation.
2. Type "open" and the IP address of your router. Then type "root" and
   SMT password as requested.
3. Locate the 'rom-0' file.
4. Type 'get rom-0' to back up the current router configuration to
   your workstation.

For details on FTP commands, please consult the documentation of your FTP
client program. For details on backup using TFTP (note that you must remain
in this menu to back up using TFTP), please see your router manual.


Press ENTER to Exit:
```

Figure 10-1 Telnet in Menu 24.5

10.2.2 Using the FTP Command from the Command Line

Step 1. Launch the FTP client on your computer.

Step 2. Enter "open", followed by a space and the IP address of your VES-1000 Series switch.

Step 3. Press [ENTER] when prompted for a username.

Step 4. Enter your password as requested (the default is "1234").

Step 5. Enter "bin" to set transfer mode to binary.

Step 6. Use "get" to transfer files from the VES-1000 Series switch to the computer, for example, "get rom-0 config.rom" transfers the configuration file on the VES-1000 Series switch to your computer and renames it "config.rom". See earlier in this chapter for more information on filename conventions.

Step 7. Enter "quit" to exit the ftp prompt.

10.2.3 Example of FTP Commands from the Command Line

```
331 Enter PASS command
Password:
230 Logged in
ftp> bin
200 Type I OK
ftp> get rom-0 zyxel.rom
200 Port command okay
150 Opening data connection for STOR ras
226 File received OK
ftp: 16384 bytes sent in 1.10Seconds
297.89Kbytes/sec.
ftp> quit
```

Figure 10-2 FTP Session Example

10.2.4 GUI-based FTP Clients

The following table describes some of the commands that you may see in GUI-based FTP clients.

Table 10-B General Commands for GUI-based FTP Clients

COMMAND	DESCRIPTION
Host Address	Enter the address of the host server.
Login Type	Anonymous. This is when a user I.D. and password is automatically supplied to the server for anonymous access. Anonymous logins will work only if your ISP or service administrator has enabled this option. Normal. The server requires a unique User ID and Password to login.

Table 10-B General Commands for GUI-based FTP Clients

COMMAND	DESCRIPTION
Transfer Type	Transfer files in either ASCII (plain text format) or in binary mode.
Initial Remote Directory	Specify the default remote directory (path).
Initial Local Directory	Specify the default local directory (path).

10.2.5 TFTP and FTP over WAN Restrictions

TFTP and FTP over WAN will not work when:

- Telnet service is disabled in menu 24.11.
- The IP address(es) in the **Secured Client Sets** menu (menu 24.11.1) does not match the client IP address. If it does not match, the VES-1000 Series switch will disconnect the Telnet session immediately.
- There is an SMT console session running.

10.2.6 Backup Configuration Using TFTP

The VES-1000 Series switch supports the up/downloading of the firmware and the configuration file using TFTP (Trivial File Transfer Protocol) over LAN. Although TFTP should work over WAN as well, it is not recommended.

To use TFTP, your computer must have both telnet and TFTP clients. To backup the configuration file, follow the procedure shown next.

Step 1. Use telnet from your computer to connect to the VES-1000 Series switch and log in. Because TFTP does not have any security checks, the VES-1000 Series switch records the IP address of the telnet client and accepts TFTP requests only from this address.

Step 2. Put the SMT in command interpreter (CI) mode by entering 8 in **Menu 24 – System Maintenance**.

Step 3. Enter command “sys stdio 0” to disable the SMT timeout, so the TFTP transfer will not be interrupted. Enter command “sys stdio 5” to restore the five-minute SMT timeout (default) when the file transfer is complete.

Step 4. Launch the TFTP client on your computer and connect to the VES-1000 Series switch. Set the transfer mode to binary before starting data transfer.

Step 5. Use the TFTP client (see the example below) to transfer files between the VES-1000 Series switch and the computer. The file name for the configuration file is “rom-0” (rom-zero, not capital o).

Note that the telnet connection must be active and the SMT in CI mode before and during the TFTP transfer. For details on TFTP commands (see following example), please consult the documentation of your TFTP client program. For UNIX, use “get” to transfer from the VES-1000 Series switch to the computer and “binary” to set binary transfer mode.

10.2.7 TFTP Command Example

The following is an example TFTP command:

```
tftp [-i] host get rom-0 config.rom
```

where "i" specifies binary image transfer mode (use this mode when transferring binary files), "host" is the VES-1000 Series switch IP address, "get" transfers the file source on the VES-1012 (rom-0, name of the configuration file on the VES-1000 Series switch) to the file destination on the computer and renames it config.rom.

10.2.8 GUI-based TFTP Clients

The following table describes some of the fields that you may see in GUI-based TFTP clients.

Table 10-C General Commands for GUI-based TFTP Clients

COMMAND	DESCRIPTION
Host	Enter the IP address of the VES-1000 Series switch. 192.168.1.1 is the VES-1000 Series switch's default IP address when shipped.
Send/Fetch	Use "Send" to upload the file to the VES-1000 Series switch and "Fetch" to back up the file on your computer.
Local File	Enter the path and name of the firmware file (*.bin extension) or configuration file (*.rom extension) on your computer.
Remote File	This is the filename on the VES-1000 Series switch. The filename for the firmware is "ras" and for the configuration file, is "rom-0".
Binary	Transfer the file in binary mode.
Abort	Stop transfer of the file.

Refer to *section 10.2.5* to read about configurations that disallow TFTP and FTP over WAN.

10.2.9 Backup Via Console Port

Back up configuration via console port by following the HyperTerminal procedure shown next. Procedures using other serial communications programs should be similar.

Step 1. Display menu 24.5 and enter "y" at the following screen.

```
Ready to backup Configuration via Xmodem.
Do you want to continue (y/n):
```

Figure 10-3 System Maintenance - Backup Configuration

Step 2. The following screen indicates that the Xmodem download has started.

```
You can enter ctrl-x to terminate operation any
time.
Starting XMODEM download...
```

Figure 10-4 System Maintenance - Starting Xmodem Download Screen

Step 3. Run the HyperTerminal program by clicking **Transfer**, then **Receive File** as shown in the following screen.

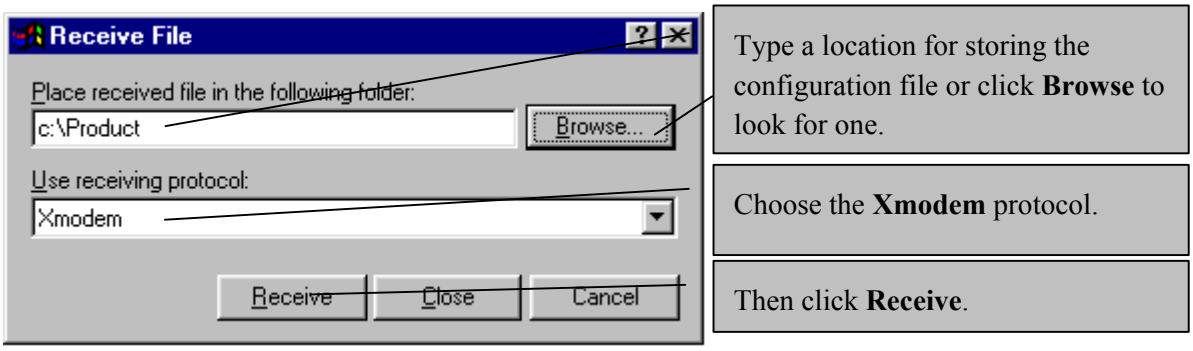


Figure 10-5 Backup Configuration Example

Step 4. After a successful backup you will see the following screen. Press any key to return to the SMT menu.

```
** Backup Configuration completed. OK.
### Hit any key to continue.###
```

Figure 10-6 Successful Backup Confirmation Screen

10.3 Restore Configuration

This section shows you how to restore a previously saved configuration. Note that this function erases the current configuration before restoring a previous back up configuration; please do not attempt to restore unless you have a backup configuration file stored on disk.

FTP is the preferred method for restoring your current computer configuration to your VES-1000 Series switch since FTP is faster. Please note that you must wait for the system to automatically restart after the file transfer is complete.

WARNING!
DO NOT INTERUPT THE FILE TRANSFER PROCESS AS THIS MAY PERMANENTLY DAMAGE YOUR VES-1000 SERIES SWITCH. WHEN THE RESTORE CONFIGURATION PROCESS IS COMPLETE, THE VES-1000 SERIES SWITCH WILL AUTOMATICALLY RESTART.

10.3.1 Restore Using FTP or TFTP

For details about backup using (T)FTP please refer to earlier sections on FTP and TFTP file upload in this chapter.

```
              Menu 24.6 -- System Maintenance — Restore Configuration

To transfer the firmware and configuration file to your workstation, follow the
procedure below:

1. Launch the FTP client on your workstation.
2. Type "open" and the IP address of your router. Then type "root" and
   SMT password as requested.
3. Type "put backupfilename rom-0" where backupfilename is the name of
   your backup configuration file on your workstation and rom-spt is the
   remote file name on the router. This restores the configuration to
   your router.
4. The system reboots automatically after a successful file transfer

For details on FTP commands, please consult the documentation of your FTP
client program. For details on backup using TFTP (note that you must remain
in this menu to back up using TFTP), please see your router manual.


Press ENTER to Exit:
```

Figure 10-7 Telnet into Menu 24.6

FTP Restore Procedure

Step 1. Launch the FTP client on your computer.

Step 2. Enter “open”, followed by a space and the IP address of your VES-1000 Series switch.

Step 3. Press [ENTER] when prompted for a username.

Step 4. Enter your password as requested (the default is “1234”).

Step 5. Enter “bin” to set transfer mode to binary.

Step 6. Find the “rom” file (on your computer) that you want to restore to your VES-1000 Series switch.

Step 7. Use “put” to transfer files from the VES-1000 Series switch to the computer, for example, “put config.rom rom-0” transfers the configuration file “config.rom” on your computer to the VES-1000 Series switch. See earlier in this chapter for more information on filename conventions.

Step 8. Enter “quit” to exit the ftp prompt. The VES-1000 Series switch will automatically restart after a successful restore process.

10.3.2 FTP Restore Example

```
ftp> put config.rom rom-0
200 Port command okay
150 Opening data connection for STOR rom-0
226 File received OK
221 Goodbye for writing flash
ftp: 16384 bytes sent in 0.06Seconds 273.07Kbytes/sec.
ftp>quit
```

Figure 10-8 FTP Restore Example

Refer to *section 10.2.5* to read about configurations that disallow TFTP and FTP over WAN.

10.3.3 Restore Via Console Port

Restore configuration via console port by following the HyperTerminal procedure shown next. Procedures using other serial communications programs should be similar.

Step 1. Display menu 24.6 and enter "y" at the following screen.

```
Ready to restore Configuration via Xmodem.
Do you want to continue (y/n):
```

Figure 10-9 System Maintenance - Restore Configuration

Step 2. The following screen indicates that the Xmodem download has started.

```
Starting XMODEM download (CRC mode) ...
CCCCCCCCC
```

Figure 10-10 System Maintenance - Starting Xmodem Download Screen

Step 3. Run the HyperTerminal program by clicking **Transfer**, then **Send File** as shown in the following screen.

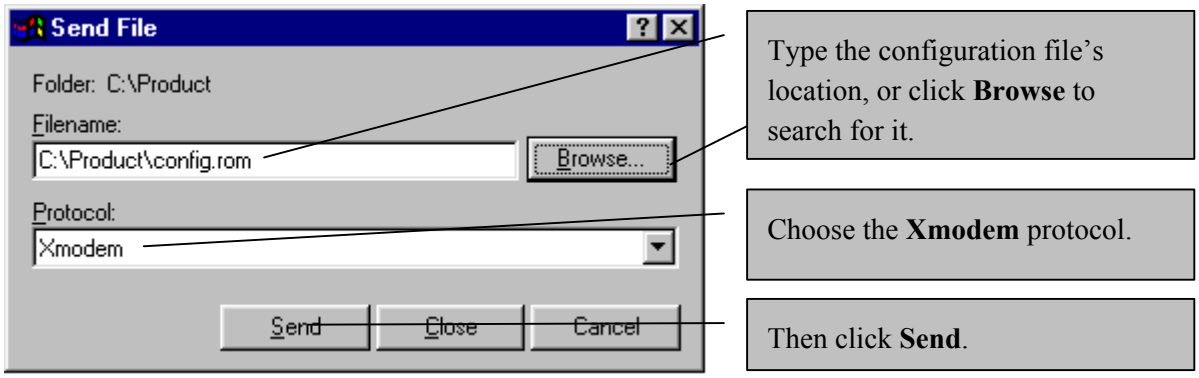


Figure 10-11 Restore Configuration Example

Step 4. After a successful restoration you will see the following screen. Press any key to restart the VES-1000 Series switch and return to the SMT menu.

```
Save to ROM
Hit any key to start system reboot.
```

Figure 10-12 Successful Restoration Confirmation Screen

10.4 Uploading Firmware and Configuration Files

This section shows you how to upload firmware and configuration files. You can upload configuration files by following the procedure in the previous *Restore Configuration* section or by following the instructions in **Menu 24.7.2 — System Maintenance — Upload System Configuration File** (for console port).

WARNING!
DO NOT INTERUPT THE FILE TRANSFER PROCESS AS THIS MAY PERMANENTLY DAMAGE YOUR VES-1000 SERIES SWITCH.

10.4.1 Firmware File Upload

FTP is the preferred method for uploading the firmware and configuration. To use this feature, your computer must have an FTP client.

When you telnet into the VES-1000 Series switch, you will see the following screens for uploading firmware and the configuration file using FTP.

```
            Menu 24.7.1 — System Maintenance — Upload System Firmware

To upload the system firmware, follow the procedure below:

  1. Launch the FTP client on your workstation.
  2. Type "open" and the IP address of your system. Then type "root" and
     SMT password as requested.
  3. Type "put firmwarefilename ras" where "firmwarefilename" is the name
     of your firmware upgrade file on your workstation and "ras" is the
     remote file name on the system.
  4. The system reboots automatically after a successful firmware upload.

For details on FTP commands, please consult the documentation of your FTP
client program. For details on uploading system firmware using TFTP (note
that you must remain on this menu to upload system firmware using TFTP),
please see your manual.

Press ENTER to Exit:
```

Figure 10-13 Telnet Into Menu 24.7.1 - Upload System Firmware

10.4.2 Configuration File Upload

You see the following screen when you telnet into menu 24.7.2.

```
        Menu 24.7.2 — System Maintenance — Upload System Configuration File

To upload the system configuration file, follow the procedure below:

  1. Launch the FTP client on your workstation.
  2. Type "open" and the IP address of your system. Then type "root" and
     SMT password as requested.
  3. Type "put configurationfilename rom-0" where "configurationfilename"
     is the name of your system configuration file on your workstation, which
     will be transferred to the "rom-0" file on the system.
  4. The system reboots automatically after the upload system configuration
     file process is complete.

For details on FTP commands, please consult the documentation of your FTP
client program. For details on uploading system firmware using TFTP (note
that you must remain on this menu to upload system firmware using TFTP),
please see your manual.

Press ENTER to Exit:
```

Figure 10-14 Telnet Into Menu 24.7.2 - System Maintenance

To upload the firmware and the configuration file, follow these examples

10.4.3 FTP File Upload Command from the DOS Prompt Example

Step 1. Launch the FTP client on your computer.

Step 2. Enter “open”, followed by a space and the IP address of your VES-1000 Series switch.

Step 3. Press [ENTER] when prompted for a username.

Step 4. Enter your password as requested (the default is “1234”).

Step 5. Enter “bin” to set transfer mode to binary.

Step 6. Use “put” to transfer files from the computer to the VES-1000 Series switch, for example, “put firmware.bin ras” transfers the firmware on your computer (firmware.bin) to the VES-1000 Series switch and renames it “ras”. Similarly, “put config.rom rom-0” transfers the configuration file on your computer (config.rom) to the VES-1000 Series switch and renames it “rom-0”. Likewise “get rom-0 config.rom” transfers the configuration file on the VES-1000 Series switch to your computer and renames it “config.rom.” See earlier in this chapter for more information on filename conventions.

Step 7. Enter “quit” to exit the ftp prompt.

10.4.4 FTP Session Example of Firmware File Upload

```
331 Enter PASS command
Password:
230 Logged in
ftp> bin
200 Type I OK
ftp> put firmware.bin ras
200 Port command okay
150 Opening data connection for STOR ras
226 File received OK
ftp: 1103936 bytes sent in 1.10Seconds
297.89Kbytes/sec.
ftp> quit
```

Figure 10-15 FTP Session Example of Firmware File Upload

More commands (found in GUI-based FTP clients) are listed earlier in this chapter.

Refer to *section 10.2.5* to read about configurations that disallow TFTP and FTP over WAN.

10.4.5 TFTP File Upload

The VES-1000 Series switch also supports the uploading of firmware files using TFTP (Trivial File Transfer Protocol) over LAN. Although TFTP should work over WAN as well, it is not recommended.

To use TFTP, your computer must have both telnet and TFTP clients. To transfer the firmware and the configuration file, follow the procedure shown next.

Step 1. Use telnet from your computer to connect to the VES-1000 Series switch and log in. Because TFTP does not have any security checks, the VES-1000 Series switch records the IP address of the telnet client and accepts TFTP requests only from this address.

Step 2. Put the SMT in command interpreter (CI) mode by entering 8 in **Menu 24 – System Maintenance**.

Step 3. Enter the command “sys stdio 0” to disable the console timeout, so the TFTP transfer will not be interrupted. Enter “command sys stdio 5” to restore the five-minute console timeout (default) when the file transfer is complete.

Step 4. Launch the TFTP client on your computer and connect to the VES-1000 Series switch. Set the transfer mode to binary before starting data transfer.

Step 5. Use the TFTP client (see the example below) to transfer files between the VES-1000 Series switch and the computer. The file name for the firmware is “ras”.

Note that the telnet connection must be active and the VES-1000 Series switch in CI mode before and during the TFTP transfer. For details on TFTP commands (see following example), please consult the documentation of your TFTP client program. For UNIX, use “get” to transfer from the VES-1000 Series switch to the computer, “put” the other way around, and “binary” to set binary transfer mode.

10.4.6 TFTP Upload Command Example

The following is an example TFTP command:

```
tftp [-i] host put firmware.bin ras
```

where “i” specifies binary image transfer mode (use this mode when transferring binary files), “host” is the VES-1000 Series switch’s IP address, “put” transfers the file source on the computer (firmware.bin – name of the firmware on the computer) to the file destination on the remote host (ras — name of the firmware on the VES-1000 Series switch).

Commands that you may see in GUI-based TFTP clients are listed earlier in this chapter.

10.4.7 Uploading Via Console Port

FTP or TFTP are the preferred methods for uploading firmware to your VES-1000 Series switch. However, in the event of your network being down, uploading files is only possible with a direct connection to your VES-1000 Series switch via the console port. Uploading files via the console port under normal conditions is not recommended since FTP or TFTP is faster. Any serial communications program should work fine; however, you must use the Xmodem protocol to perform the download/upload.

10.4.8 Uploading Firmware File Via Console Port

Step 1. Select 1 from **Menu 24.7 – System Maintenance – Upload Firmware** to display **Menu 24.7.1 — System Maintenance — Upload System Firmware**, then follow the instructions as shown in the following screen.

```
            Menu 24.7.1 — System Maintenance — Upload System Firmware


        To upload system firmware:

        1. Enter "y" at the prompt below to go into debug mode.
        2. Enter "atur" after "Enter Debug Mode" message.
        3. Wait for "Starting XMODEM upload" message before activating
           Xmodem upload on your terminal.
        4. After successful firmware upload, enter "atgo" to restart the
           router.

        Warning: Proceeding with the upload will erase the current router
        firmware.
                         Do You Wish To Proceed:(Y/N)
```

Figure 10-16 Menu 24.7.1 as seen using the Console Port

Step 2. After the "Starting Xmodem upload" message appears, activate the Xmodem protocol on your computer. Follow the procedure as shown previously for the HyperTerminal program. The procedure for other serial communications programs should be similar.

10.4.9 Example Xmodem Firmware Upload Using HyperTerminal

Click **Transfer**, then **Send File** to display the following screen.

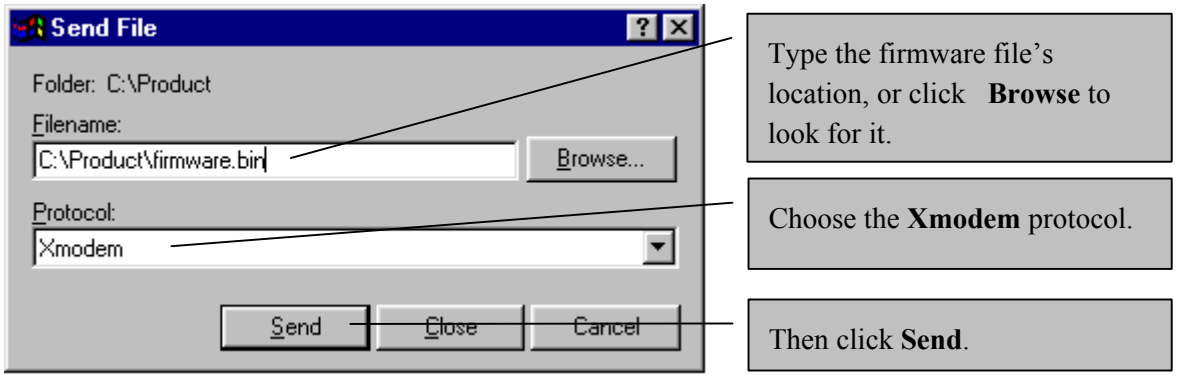


Figure 10-17 Example Xmodem Upload

After the firmware upload process has completed, the VES-1000 Series switch will automatically restart.

10.4.10 Uploading Configuration File Via Console Port

Step 1. Select 2 from **Menu 24.7 – System Maintenance – Upload Firmware** to display **Menu 24.7.2 — System Maintenance — Upload System Configuration File**. Follow the instructions as shown in the next screen.

```
          Menu 24.7.2 — System Maintenance — Upload System Configuration File


          To upload system configuration file:

          1. Enter "y" at the prompt below to go into debug mode.
          2. Enter "atlc" after "Enter Debug Mode" message.
          3. Wait for "Starting XMODEM upload" message before activating
             Xmodem upload on your terminal.
          4. After successful firmware upload, enter "atgo" to restart the
             router.

          Warning:
          1. Proceeding with the upload will erase the current
             configuration file.
          2. The router's console port speed (Menu 24.2.2) may change
             when it is restarted; please adjust your terminal's speed
             accordingly. The password may change (menu 23), also.
          3. When uploading the DEFAULT configuration file, the console
             port speed will be reset to 9600 bps and the password to
             "1234".
                          Do You Wish To Proceed:(Y/N)
```

Figure 10-18 Menu 24.7.2 as seen using the Console Port

Step 2. After the "Starting Xmodem upload" message appears, activate the Xmodem protocol on your computer. Follow the procedure as shown previously for the HyperTerminal program. The procedure for other serial communications programs should be similar.

Step 3. Enter “atgo” to restart the VES-1000 Series switch.

10.4.11 Example Xmodem Configuration Upload Using

HyperTerminal

Click **Transfer**, then **Send File** to display the following screen.

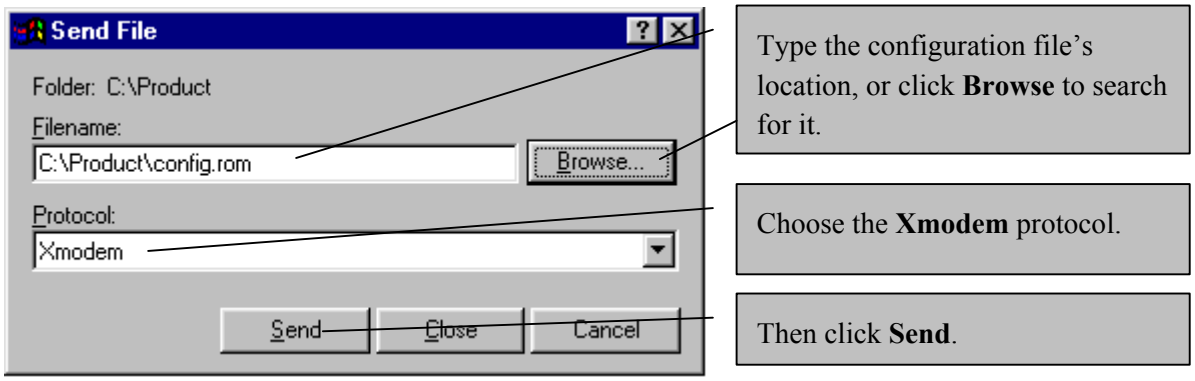


Figure 10-19 Example Xmodem Upload

After the configuration upload process has completed, restart the VES-1000 Series switch by entering "atgo".

Chapter 11
System Maintenance 2

This chapter discusses CI Mode, Remote Management Control and Hardware Monitor SMT menus.

11.1 Command Interpreter Mode

This option allows you to enter command interpreter mode, which allows more advanced system diagnosis and troubleshooting. Enter 8 from **Menu 24 – System Maintenance**. A list of valid commands can be found by typing "help" or "?" at the command prompt. Enter "exit" to return to the SMT main menu when finished.

```
Valid commands are:
sys             exit            device          ether
vdsl            ip              sw
test>
```

Figure 11-1 Valid CI Commands

See the later chapters for more detailed information on CI commands.

11.2 Time and Date Setting

Menu 24.10 - Time and Date Setting allows you to set the time manually or get the current time and date from an external server when you turn on your VES-1000 Series switch. The real time is then displayed in the VES-1000 Series switch logs.

Select menu 24 in the main menu to open **Menu 24 - System Maintenance** and then enter 10 to go to **Menu 24.10 — System Maintenance — Time and Date Setting** to update the time and date settings of your VES-1000 Series switch as shown in the following screen.

```
                Menu 24.10 - System Maintenance - Time and Date Setting


            Use Time Server when Bootup= None
            Time Server IP Address= N/A

            Current Time:                   00 : 00 : 00
            New Time (hh:mm:ss):            11 : 23 : 16

            Current Date:                   2000 - 01 - 01
            New Date (yyyy-mm-dd):          2001 - 01 - 01

            Time Zone= GMT+0800

                      Press ENTER to Confirm or ESC to Cancel:

    Press Space Bar to Toggle.
```

Figure 11-2 Menu 24.10 System Maintenance - Time and Date Setting

Table 11-A Time and Date Setting Fields

FIELD	DESCRIPTION
Use Time Server when Bootup	Enter the time service protocol that your time server sends when you turn on the VES-1000 Series switch. Not all time servers support all protocols, so you may have to check with your ISP/network administrator or use trial and error to find a protocol that works. The main differences between them are the format. **Daytime (RFC 867)** format is day/month/year/time zone of the server. **Time (RFC-868)** format displays a 4-byte integer giving the total number of seconds since 1970/1/1 at 0:0:0. **NTP (RFC-1305)** is similar to **Time (RFC-868)**. **None** is the default value. Enter the time manually. Each time you turn on the VES-1000 Series switch, the time and date will be reset to 2000-1-1 0:0:0.
Time Server IP Address	Enter the IP address of your time server. Check with your ISP/network administrator if you are unsure of this information.
Current Time	This field displays an updated time only when you reenter this menu.
New Time	Enter the new time in hour, minute and second format.
Current Date	This field displays an updated date only when you reenter this menu.
New Date	Enter the new date in year, month and day format.
Time Zone	Press [SPACE BAR] to set the time difference between your time zone and Greenwich Mean Time (GMT).
Once you have filled in this menu, press [ENTER] at the message “Press ENTER to Confirm or ESC to Cancel“ to save your configuration, or press [ESC] to cancel.	

11.2.1 Resetting The Time

The VES-1000 Series switch resets the time in three instances:

i. On leaving menu 24.10 after making changes.

ii. When the VES-1000 Series switch boots up and there is a time server configured in menu 24.10.

iii. 24-hour intervals after starting.

11.3 Remote Management Control

Remote management control is for managing Telnet, Web, FTP and ICMP services. You can customize the service port and the secured client IP address to enhance security and flexibility.

To disable remote management of a service, select **Disable** in the corresponding **Server Access** field.

Enter 11 from menu 24 to bring up **Menu 24.11 – Remote Management Control**.

```
                          Menu 24.11 – Remote Management Control

                           Service Access:
                             TELNET service= Enable
                               Server Port= 23
                             FTP Service= Enable
                               Server Port= 21
                             ICMP Service= Enable

                           Edit Secured Clients= No


                         Press ENTER to Confirm or ESC to Cancel:

      Press Space Bar to Toggle.
```

Figure 11-3 Menu 24.11 – Remote Management Control

Table 11-B Menu 24.11 – Remote Management Control

FIELD	DESCRIPTION	EXAMPLE
TELNET/FTP/ICMP Server Access	Press the [SPACE BAR] to select **Enable** and then press [ENTER] to allow remote Telnet, FTP and/or ICMP service.	**Enable**
Service Port	Many residential broadband ISP accounts do not allow you to run any server processes (such as an FTP server) from your location. If you wish to run such a server from your location, you must change the default service port number. Type in the new service port number here that corresponds to the new port number you configured on the server.	23
Edit Secured Clients	Secured clients are trusted computers that may access the defined services on the VES-1000 Series switch. Press [SPACE BAR] once to select **Yes** and then press [ENTER] to go to SMT **Menu 24.1.1 – Secured Client Sets**.	**No**
Once you have filled in this menu, press [ENTER] at the message "Press ENTER to Confirm or ESC to Cancel" to save your configuration, or press [ESC] to cancel.		

11.3.1 Secured Client Sets

Press [SPACE BAR] once in the **Edit Secured Clients** field (menu 24.11) to select **Yes** and then press [ENTER] to go to SMT **Menu 24.1.1 – Secured Client Sets**. This is a read-only menu.

```
                Menu 24.11.1 — Secured Client Sets

# A     Addr_START       Addr_END          T F I
— -   ---------------  ---------------     — - -
1 A   0.0.0.0          0.0.0.0             Y Y Y
2 N
3 N
4 N


          Enter client set (1-4) to configure:
```

Figure 11-4 Menu 24.11.1 - Secured Client Sets

Table 11-C Menu 24.11.1 - Secured Client Sets

FIELD	DESCRIPTION	EXAMPLE
#	This is the client set index number.	1
A	“A” indicates the client set is Active and “N” indicates that it is Not active	A
Addr_START	The default value for a start and end address is 0.0.0.0, which means you don’t care which host is trying to use a service (Telnet, FTP, ICMP).	0.0.0.0
Addr_END	This field displays the end IP address in a range of client IP addresses that may use the service(s) defined in the next field.	0.0.0.0
TFI	“Y” (Yes) means that the specified service (T for Telnet, F for FTP and I for ICMP) is enabled for this client set. Similarly, “N” (No) means it is not.	YNY
To edit a client set, type a client set index number and then press [ENTER] or press [ESC] to cancel and go back to menu 24.11.		

11.3.2 Secured Client Configuration

Type a client set index number in menu 24.11.1 and then press [ENTER] to display this menu.

```
          Menu 24.11.1.1 — Secured Client Configuration

        Active= Yes
          Secured IP:
            addr start= 0.0.0.0
            addr end= N/A
          Service Type:
            TELNET Service= Yes
            FTP Service= Yes
            ICMP Service= Yes
```

Figure 11-5 Menu 24.11.1.1 - Secured Client Configuration

Table 11-D Menu 24.11.1.1 - Secured Client Configuration

FIELD	DESCRIPTION	EXAMPLE
Active	Press [SPACE BAR] once to select **Yes** and then press [ENTER] to make this client set active. This displays as “A” in menu 24.1.1.	**Yes**

Table 11-D Menu 24.11.1.1 - Secured Client Configuration

FIELD	DESCRIPTION	EXAMPLE
Secured IP		
addr_start	To allow a range of computers to use Telnet, FTP or ICMP services then enter the first IP address in the range here. The default value for a start and end address is 0.0.0.0, which means you don't care which host is trying to use a service (Telnet, FTP, or ICMP). If you enter an IP address in this field, the VES-1000 Series switch will check if the client IP address matches the value here when a (Telnet, FTP, or ICMP) session is up. If it does not match, the VES-1000 Series switch will disconnect the session immediately. If the service field is disabled in menu 24.11, then this field and the next field are **N/A**.	0.0.0.0
addr_end	To allow a range of computers to use Telnet, FTP or ICMP services, enter the end IP address in the range here. To allow a single computer to use Telnet, FTP or ICMP services, enter the same IP address here as in the previous field.	0.0.0.0
Service Type		
TELNET Service	Press [SPACE BAR] to select **Yes** or **No** and then press [ENTER] to activate/deactivate this service for the trusted computers specified above.	**Yes**
FTP Service	Press [SPACE BAR] to select **Yes** or **No** and then press [ENTER] to activate/deactivate this service for the trusted computers specified above.	**Yes**
ICMP Service	Press [SPACE BAR] once to select **Yes** or **No** and then press [ENTER] to activate/deactivate this service for the trusted computers specified above.	**Yes**
Once you have filled in this menu, press [ENTER] at the message "Press ENTER to Confirm or ESC to Cancel" to save your configuration, or press [ESC] to cancel.		

11.4 Hardware Monitor

Enter 12 from **Menu 24 – System Maintenance** to go to the next menu shown.

```
                    Menu 24.12 — Hardware Monitor
Temperature(C)   Current          Max      Min     Threshold      Status
  TEMP1            35.0            37.0     34.0     65.0          Normal
  TEMP2            32.5            35.5     30.0     65.0          Normal
  TEMP3            43.0            46.0     40.5     65.0          Normal

Fan speed(RPM)   Current          Max      Min     Threshold      Status
  FAN1 RPM          7670           7803     7417     4000          Normal
  FAN2 RPM          7714           7848     7458     4000          Normal
  FAN3 RPM          7258           7584     7180     4000          Normal
  FAN4 RPM          7714           7894     7541     4000          Normal

  Voltage(V)      Current          Max      Min    Tolerance(%)   Status
  2.0               2.06           2.11     2.02       5          Normal
  2.5               2.61           2.62     2.58       5          Normal
  3.3               3.31           3.36     3.30       5          Normal
  5.0               5.06           5.15     4.99       5          Normal
  15.0             14.53          15.02    14.35       5          Normal
  -5.0             -5.15          -5.15    -5.25       5          Normal
                            Press Command:
                   COMMANDS:r-Reset status  ESC-exit
```

Figure 11-6 Menu 24.12 - Hardware Monitor

Table 11-E Menu 24.12 - Hardware Monitor

FIELD	DESCRIPTION	EXAMPLE
Temperature (C)	There are three temperature sensors inside the VES-1000 Series switch. Each sensor is capable of detecting and reporting if the temperature rises *above* the threshold of 65 degrees centigrade. Temp 1 refers to the first temperature sensor.	Temp1
Current	This shows the current temperature in degrees centigrade at this sensor.	35.0
Max	This field displays the maximum temperature measured at this sensor.	37.0
Min	This field displays the minimum temperature measured at this sensor.	34.0
Threshold	This field displays the upper temperature limit at this sensor.	65.0
Status	This field displays “Normal” for temperatures below the threshold.	Normal
Fan speed (VES-1012 only)	A properly functioning fan is an essential component (along with a sufficiently ventilated, cool operating environment) in order for the VES-1012 switch to stay within temperature thresholds. Each fan has a sensor that is capable of detecting and reporting if the fan speed falls *below* the threshold of 4000 RPM.	
Current	This field displays this fan’s current speed in Revolutions Per Minute (RPM).	7673
Max	This field displays this fan’s maximum speed measured in Revolutions Per Minute (RPM).	7803
Min	This field displays this fan’s minimum speed measured in Revolutions Per Minute (RPM).	7417
Threshold	This field displays the minimum speed at which a normal fan should work.	4000
Status	“Normal” indicates that this fan is functioning above the minimum speed.	Normal
Voltage (V)	The power supply for each voltage has a sensor that is capable of detecting and reporting if the voltage falls out of the tolerance range.	V2.0

Table 11-E Menu 24.12 - Hardware Monitor

FIELD	DESCRIPTION	EXAMPLE
Current	This is the current voltage reading.	2.03
Max	This field displays the maximum voltage measured at this point.	
Min	This field displays the minimum voltage measured at this point.	
Tolerance (%)	Five percent is the acceptable deviation from the nominal voltage.	5%
Status	"Normal" indicates that the voltage is within an acceptable operating range at this point.	Normal
COMMANDS:		
r-Reset status	Enter "r" to refresh all the counters in this menu.	r
ESC-exit	Press [ESC] to exit this menu and return to SMT menu 24.	[ESC]

If an error is detected:

- The associated **Status** field in **Menu 24.12 — Hardware Monitor** will display **Error**.
- The ALM (alarm) LED on the front panel will light.

To clear an alarm, enter "r" in **Menu 24.12 — Hardware Monitor**.

Part V:

Line Interface Commands and Troubleshooting

This part introduces line interface commands and offers some troubleshooting strategies.

Chapter 12
VDSL-Related Commands

This chapter shows you how to configure VDSL using line interface commands.

12.1 Introduction

CI commands are an alternative way (to SMT menus) of configuring your VES-1000 Series switch. They contain more advanced features that may be used for debugging and troubleshooting. Please exercise caution when using CI commands as incorrect usage may damage your VES-1000 Series switch.

12.1.1 VDSL Default Values

The default values for the following VDSL parameters are shown in the next table.

Table 12-A VDSL Default Values

VDSL PARAMETER	DEFAULT VALUE
VDSL Mode	0 = 10BaseS mode
VDSL Active	Off
VDSL Upstream Rate	12.5 Mbps
VDSL Downstream Rate	12.5 Mbps

Enter 8 from menu 24 to go to CI command mode.

```
Menu 24 — System Maintenance

 1. System Status
 2. System Information and Console Port Speed
 3. Log and Trace
 4. Diagnostic
 5. Backup Configuration
 6. Restore Configuration
 7. Upload Firmware
 8. Command Interpreter Mode


11. Remote Management Control
12. Hardware Monitor


 Enter Menu Selection Number:
```

Figure 12-1 CI Command Mode

Type "?" to see the first level of commands.

```
ves1012> ?
Valid commands are:
sys             exit            ether           vdsl
ip              sw              prot
ves1012>
```

Figure 12-2 CI Commands

12.2VDSL Commands

The following table is a summary of VDSL-related commands.

Table 12-B VDSL-related Commands

COMMAND	DESCRIPTION
`vdsl uprate chan-id (x)`	This command sets the VDSL upstream rate (0 to 4)
`vdsl downrate chan-id (y)`	This command sets the VDSL downstream rate (0 to 4)
`vdsl patch chan-id [lt|nt]`	This command loads new VDSL modem code into the VES-1000 Series switch (nt) or VDSL subscriber modem (lt).
`vdsl reset chan-id [lt|nt]`	This command resets the VDSL chip.
`vdsl reconnect chan-id`	Make VDSL reconnect
`vdsl clear chan-id`	Clear VDSL related counters
`vdsl debug chan-id [on|off]`	This command sets the VDSL debug flag.
`vdsl monitor chan-id [on|off]`	This command sets the VDSL monitor flag.
`vdsl status chan-id`	This command shows the VDSL status counters.
`vdsl show chan-id`	This command shows VDSL settings.
`vdsl mode chan-id (mode)`	This command changes the VDSL mode (0 = 10BaseS, 1 = ANSI, 2 = ETSI).
`vdsl active chan-id [on|off]`	This command actives/deactivates the VDSL driver.
`vdsl autoupg chan-id [on|off]`	This command enables/disables NT modem F/W auto upgrade.
`vdsl ver`	This command shows the VDSL driver version.
`vdsl quality chan-id`	This command shows VDSL quality.
`vdsl enet status chan-id`	This command shows Ethernet status counters.
`vdsl enet clear chan-id`	This command clears Ethernet status counters.
`vdsl enet monitor chan-id [on|off]`	This command sets the VDSL chip Ethernet monitor flag
`vdsl enet phy chan-id`	This command shows the NT Ethernet PHY registers.

“chan-id” (“vdsl01”, “vdsl02”,…”vdsl12”) refers to the channel name for each VDSL channels. “all” is also a valid channel name that indicate all channels.

All VDSL parameters and flags set using VDSL commands are effective at run-time only. If you restart the VES-1000 Series switch, you will lose the configuration changes you made with commands. To save changes permanently, please use the appropriate SMT menu.

The rest of this chapter shows commonly used VDSL-related CI command examples.

12.2.1 Set VDSL Mode

```
vdsl mode chan-id (mode)
```

This command sets the VDSL mode.

After you set the mode is set, you must use "vdsl reset chan-id**" or "**vdsl recon chan-id**" to force the VDSL channel to reconnect.**

The modes are listed here:

Table 12-C Set VDSL Mode by CI Command

MODE NUMBER	MODE TYPE
0	10Base-S mode
1	ANSI/ETSI Band Plan 998
2	ETSI Band Plan 997

The band plan is different for each mode even though the speed may be the same.

Please refer to *Table 4-C* for more information on VDSL mode frequency bands and speeds.

12.2.2 Activate / Deactivate the VDSL Driver

```
vdsl active chan-id [on|off]
```

This command actives or deactivates the VDSL driver.

After you set the driver, you must use "vdsl reset chan-id**" or "**vdsl recon chan-id **" to forcibly bring up the VDSL channel.**

12.2.3 Set Upstream/Downstream VDSL Rates

Upstream

```
vdsl uprate chan-id [uprate]
```

"uprate" is an integer from 0 to 4 defined in the next table. This command sets the upstream VDSL rate. After you set the rate, you must use "vdsl reset chan-id" or "vdsl recon chan-id" to reconnect the VDSL channel.

Downstream

```
vdsl downrate chan-id [downrate]
```

"downrate" is an integer from 0 to 4 defined in the next table. This command sets the upstream VDSL rate. After you set the rate, you must use "vdsl reset chan-id" or "vdsl recon chan-id" to make VDSL reconnect.

Table 12-D VDSL Rates

UPRATE/DOWN RATE	UPSTREAM RATE	DOWNSTREAM RATE
10Base-S		
0	1.56Mbps	4.17Mbps
1	6.25Mbps	6.25Mbps
2	9.38Mbps	8.33Mbps
3	12.50Mbps	12.50Mbps
4	18.75Mbps	16.67Mbps
ANSI / ETSI Plan 998		
0	1.56Mbps	4.17Mbps
1	3.13Mbps	6.25Mbps
2	6.25Mbps	8.33Mbps
3		12.50Mbps
4		16.67Mbps
ETSI Plan 997		
0	1.56Mbps	4.17Mbps
1	3.13Mbps	6.25Mbps
2	6.25Mbps	9.38Mbps
3		12.50Mbps

12.2.4 Reset a VDSL Channel

```
vdsl reset chan-id [lt|nt]
```

This command issues a software-reset command to the VDSL chip. "lt" is local or the VES-1000 Series switch VDSL chip; "nt" is the remote VDSL modem chip. The VDSL link first disconnects before the channel resets.

12.2.5 Reconnect a VDSL Channel

```
vdsl reconnect chan-id
```

This command forcibly brings up the VDSL channel.

12.2.6 View VDSL Channel Status Command

```
vdsl status chan-id
```

This command displays the status of a VDSL channel.

The SNR, MSE and RS_ERR are polled every three seconds. Total RS_ERR are counted during the connection.

SNR, MSE, RS_ERR and Total_RSERR are cleared after the VDSL is link up.

```
ves100> vdsl st vdsl01
VDSL Channel vdsl01 Parameters:
General Status Registers:
  MODEMSTAT = 0x80  LINK_STAT = 0xae  VER_SOFT = 0xb4  VER_HARD = 0x32
  RSTSTAT = 0x40  FAILCNT = 0x00
DS =  QAM 256, Int 12, Rate = 16666666 bps, fc = 1953125 Hz
US =  QAM 256, Int 12, Rate = 16666666 bps, fc = 5541992 Hz
US SNR = 36.42 36.49 36.49 36.33 36.46 36.42 36.45 36.38 dB
US MSE = 13.82 13.89 13.89 13.73 13.86 13.82 13.85 13.78 dB
DS SNR = 42.68 42.57 42.68 42.65 42.76 42.77 42.69 42.68 dB
DS MSE = 20.08 19.97 20.08 20.05 20.16 20.17 20.09 20.08 dB
Average US SNR = 36.43dB  US MSE = 13.83dB
Average DS SNR = 42.69dB  DS MSE = 20.09dB
US RS_ERR = 0 0 0 0 0 0 0 0
US Total RS_ERR = 0
DS RS_ERR = 0 0 0 0 0 0 0 0
DS Total RS_ERR = 0
Power Parameters:
  MIN_PSD = 0x10,   MAX_PSD = 0x32d
  TXPOWER = 0x32d,   POCO = 0x5
  PSD = -57.00 dBm/Hz
ves100>
```

Figure 12-3 VDSL Channel Status

Table 12-E VDSL Channel Status Counters

FIELD	DESCRIPTION
VDSL Channel Parameters: General Status Registers	
MODEMSTAT	This field displays the modem status.
LINK STAT	This field displays the link status. The link is up if this field displays 0xac or 0xae; otherwise the link is down.
VER_SOFT	This is the on-chip firmware version (not patch version).
VER_HARD	This is the chip hardware version.
RSTSTAT	Reset Status indicates the reason for the most recent system reset.
FAILCNT	This field displays VDSL Fail counter information.
DS and US	The following parameters apply to both upstream and downstream VDSL.
QAM	Constellation shows the modulation method and speed. The constellations are QAM 4, QAM 8, QAM 16, QAM 64, QAM 256 where QAM (Quadrature Amplitude Modulation) defines how many bits there are per symbol; for example QAM 4 means 2 bits per symbol (2^2), QAM 8, 3 bits (2^3) per symbol and so on.
Int	Int (Interpolation) defines how fast the symbols go through the line. It is equal to 25.0MHz / baud rate, so for example, Int 8 = 25.0 / 8 Mbaud.
Rate	This is the VDSL raw speed.
Fc	This is the carrier frequency
SNR	The higher the SNR (Signal-to-Noise Ratio) number, the better. SNR (Signal-to-Noise

Table 12-E VDSL Channel Status Counters

FIELD	DESCRIPTION
SNR	The higher the SNR (Signal-to-Noise Ratio) number, the better. SNR (Signal-to-Noise Ratio is the ratio of the amplitude of the desired signal to the amplitude of noise signals at a given point in time).
MSE	This is the Minimum Square Error. The minimum mean-square error (also known as MMSE) performance measure is a popular metric for optimal signal processing.
RS_ERR	This is the count of bit errors detected and corrected by Reed-Solomon code. Reed-Solomon codes are block-based error correcting codes and are used to correct errors in many systems.
Power Parameters:	
MIN_PSD	This is the mimimum Power Spectrum Density (power divided by bandwidth).
MAX_PSD	This is the maximum Power Spectrum Density (power divided by bandwidth).
TXPWR	This field displays transmission power information in hexadecimal format.
POCO	Port Output Control registers provide the control bit information.
PSD	This is the Power Spectrum Density (power divided by bandwidth).

12.2.7 VDSL Patch Command

```
vdsl patch [lt|nt]
```

This command makes the VES-1000 Series switch load new VDSL modem code into the VES-1000 Series switch (LT) or VDSL subscriber modem (NT). If “LT” is specified, the VES-1000 Series switch will load the VDSL modem code into the VES-1000 Series switch. If “NT” is specified, the VES-1000 Series switch will load the VDSL modem code into the VDSL subscriber modem (P841). The VDSL connection should automatically reconnect after the new VDSL modem code has been successfully loaded.

12.2.8 VDSL Version Command

```
vdsl ver
```

Use this command to see the VDSL driver version, date it was created and VDSL patch version.

```
ves-100> vdsl ver
vdsl driver version = 0.54
vdsl driver date = 12/04/2001
vdsl patch version = 0x50
ves-100>
```

Figure 12-4 VDSL Driver Version

12.2.9 Clear VDSL Channel Status

```
vdsl clear chan-id
```

This command clears the status counters of the specific VDSL channel.

12.2.10 VDSL Show Command

```
vdsl show chan-id
```

This command displays your VDSL driver settings for the channel you specify.

```
ves100> vdsl show vdsl01
VDSL Channel vdsl01 Setting:
  VDSL Port: enable
  VDSL mode: 10BaseS
  VDSL Max. upstream rate: 4
  VDSL Max. downstream rate: 4
  VDSL Curr. upstream rate: 4
  VDSL Curr. downstream rate: 4
  VDSL state: 4
  VDSL auto flag: off
  VDSL monitor flag: off
  VDSL debug flag: off
  VDSL auto upgrade NT EEPROM flag: off
  VDSL enet monitor flag: off
  NT Ethernet Speed: Auto
  NT Ethernet Flow Control: Enable
ves100>
```

Figure 12-5 VDSL Show Example

12.2.11 VDSL Quality Command

```
vdsl quality chan-id
```

Use this command to view error counters on your VDSL link.

```
ves-100> vdsl quality chan1
             US     US     US      US      US     DS     DS     DS      DS      DS
CHAN    Lnk RATE    SNR    MSE   TXPWR   RSERR  RATE    SNR    MSE   TXPWR   RSERR
           Mbps     dB     dB  dbm/Hz          Mbps     dB     dB  dbm/Hz
```

Figure 12-6 VDSL Quality Counters

Refer to *Table 12-E* for more information on these fields.

12.2.12 VDSL Debug Command

```
vdsl debug chan-id [on|off]
```

This command turns the VDSL auto flag on or off or just shows the current VDSL auto flag status (without “on” or “off”). When this flag is on, the VES-1000 Series switch displays each stage (state) of the VDSL link initialization process. When the VDSL link is up, no messages are displayed until the VDSL line is disconnected.

```
VES-100>State 0 - Initialize
  Write default parameters to LT
  Goto State 1
State 1 - Wait to connect to default rate
  Default rate connected (1113 ms)
  VDSL:US 1.56Mbps SNR 34.08dB DS 4.17Mbps SNR 43.08dB
  Change Link Watchdog Timer
  Goto State 2
State 2 - Check NT EEPROM patch, setup target rate
  NT EEPROM exists
  NT patch signature 0x55 0x50 0x32, no patch needed
  Try to connect target rate (US:0,DS:4)
  Write parameters to NT
  Write parameters to LT
  Goto State 3
State 3 - Wait to connect Target rate
  VDSL:US 1.56Mbps SNR 34.08dB DS 16.67Mbps SNR 45.62dB
  Target rate connected (1332 ms)
  Write default parameters to NT
  Write default parameters to LT
  Goto State 1
State 1 - Wait to connect to default rate
  Default rate connected (1112 ms)
  VDSL:US 1.56Mbps SNR 34.08dB DS 4.17Mbps SNR 43.08dB
  Change Link Watchdog Timer
  Goto State 2
State 2 - Check NT EEPROM patch, setup target rate
  Try to connect target rate (US:4,DS:4)
  Write parameters to NT
  Write parameters to LT
  Goto State 3
State 3 - Wait to connect Target rate
  VDSL:US 16.67Mbps SNR 37.08dB DS 16.67Mbps SNR 44.65dB
  Target rate connected (2314 ms)
  Goto State 4
State 4 - Connect State
```

Figure 12-7 VDSL Initialization Messages

These messages are for debugging purposes only. If you are having problems initializing the VDSL connection, capture this screen and send it to your nearest customer support.

12.2.13 VDSL Monitor Command

```
vdsl monitor chan-id [on|off]
```

Type this command to show the VDSL monitor flag status (without “on” or “off”) or turn on/off the VDSL monitor flag. When this flag is set (on) and the VDSL link is up, VDSL parameters are automatically displayed every five seconds.

```
ves100> vdsl mon vdsl01 on
ves100> vdsl01:VDSL:US 16.67Mbps SNR 36.43dB RSERR 0 DS 16.67Mbps SNR 42.71dB RS
ERR 0
vdsl01:VDSL:US 16.67Mbps SNR 36.34dB RSERR 0 DS 16.67Mbps SNR 42.54dB RSERR 0
vdsl01:VDSL:US 16.67Mbps SNR 36.40dB RSERR 0 DS 16.67Mbps SNR 42.60dB RSERR 0
vdsl01:VDSL:US 16.67Mbps SNR 36.54dB RSERR 0 DS 16.67Mbps SNR 42.57dB RSERR 0
vdsl01:VDSL:US 16.67Mbps SNR 36.36dB RSERR 0 DS 16.67Mbps SNR 42.68dB RSERR 0
vdsl01:VDSL:US 16.67Mbps SNR 36.46dB RSERR 0 DS 16.67Mbps SNR 42.62dB RSERR 0
```

Figure 12-8 VDSL Monitor

Refer to *Table 12-E* for more information on these fields.

12.2.14 VDSL Autoupg Command

```
vdsl autoupg chan-id [on|off]
```

Type this command to show the VDSL auto upgrade status (without “on” or “off”) or turn on/off auto upgrade. When auto upgrade is on, the VES-1000 Series switch will check the subscriber’s modem VDSL modem code version and automatically upgrade it if it is an earlier version than the VES-1000 Series switch’s.

12.3 VDSL-Ethernet-related Commands

Please refer to *sections 2.4.3, 4.2.3 and 55.2.2* for more information on Ethernet.

12.3.1 View Ethernet Status Counters

```
vdsl enet status chan-id
```

This command displays the current Ethernet counters of the VES-1000 Series switch and VDSL modem.

```
ves100> vdsl enet st vdsl01
VDSL Channel vdsl01:
LT Ethernet Counters:
  ALGM_ERR = 0        SINGLE_COL = 0      MUL_COL = 0
  LATE_COL = 0        EXC_COL = 0         MACRX_ERR = 0      CS_ERR = 0
  FTL_ERR = 0         FCS_ERR = 0         OTO = 13641294     ORO = 0
  BCF = 0             RXPAUS = 0          TXPAUS = 0         TXBCNT = 75120
  RXBCNT = 0          TX_DEF = 0
NT PHY: LSI 80225
NT Ethernet speed: 100M Full Duplex
NT Ethernet Counters:
  ALGM_ERR = 0        SINGLE_COL = 0      MUL_COL = 0
  LATE_COL = 0        EXC_COL = 0         MACRX_ERR = 1      CS_ERR = 0
  FTL_ERR = 0         FCS_ERR = 0         OTO = 0            ORO = 13642095
  BCF = 67493         RXPAUS = 0          TXPAUS = 0         TXBCNT = 0
  RXBCNT = 75138      TX_DEF = 0
ves100>
```

Figure 12-9 Ethernet Status Counters

The following table explains these parameters.

Table 12-F Ethernet Status Counters

COUNTER	MEANING
ALGM_ERR	This is the number of frames received with alignment errors (odd number of nibbles).
SINGLE_COL	A count of successfully transmitted frames for which transmission is inhibited by exactly one collision.
MUL_COL	A count of successfully transmitted frames for which transmission was inhibited by more than one collision.
LATE_COL	The number of times that a collision was detected on a particular interface later than 512 bit-times into the transmission of a packet.
EXC_COL	A count of frames for which transmission failed due to excessive collisions. Excessive collision is defined as the number of maximum collisions before the retransmission count is reset.
MACRX_ERR	This counter contains the number of frames received that were less than 64 bytes. These frames are discarded.
CS_ERR	The number of times that the carrier sense condition was lost or never asserted when attempting to transmit a frame on a particular interface.
FTL_ERR	This counter contains the number of frames received that were more than maximum length (1536 bytes). These frames are discarded.
FCS_ERR	Frame Check Sequence Errors.
OTO	A count of data and padding octets of frames that are successfully transmitted.
ORO	A count of data and padding octets of frames that are successfully received.
BCF	A count of frames that are successfully received and are directed to the broadcast group address.
RXPAUS	The number of received PAUSE packets.
TXPAUS	The number of PAUSE packets transmitted.
TXBCNT	This counter indicates the number of valid data frames that have been transferred over the transmit channel.
RXBCNT	This counter indicates the number of valid data frames that have been transferred over the receive channel.
TX_DEF	A count of frames for which the first transmission attempt was delayed because the Ethernet media was busy.

12.3.2 Clear Ethernet Counters

```
vdsl enet clear chan-id
```

This command clears the Ethernet Counters of VES-1000 Series switch and the VDSL modem (if connected to the VES-1000 Series switch).

12.3.3 VDSL Enet Speed Command

```
vdsl enet speed chan-id (lt|nt) (speed)
```

Type this command to set the Ethernet port speed of the VES-1000 Series switch (with “lt”) or VDSL subscriber modem (with “nt”). Speed parameters are explained in the following table.

Table 12-G Ethernet Speed Parameters

SPEED INDEX NUMBER	SPEED/FLOW CONTROL
0	Auto Negotiation
1	10 Mbits/s, Half Duplex
2	10 Mbits/s, Full Duplex
3	100Mbits/s, Half Duplex
4	100Mbits/s, Full Duplex

12.3.4 Enet Fctrl Command

```
vdsl enet fctrl chan-id (lt|nt) [on|off]
```

Type this command to set the Ethernet port flow control or show the Ethernet port flow control status (without “on” or “off”). By default, flow control is on for full duplex Ethernet connections and off for half duplex Ethernet connections.

```
ves-100>vdsl enet fctrl 2
enet  flow control(LT): on
```

Figure 12-10 Ethernet Flow Control

12.3.5 Enet Monitor Command

```
vdsl enet monitor chan-id [on|off]
```

When this flag is on this command automatically displays the VES-1000 Series switch (and the subscriber’s VDSL modem’s Ethernet statistics if the link is up) every five seconds. Enter the command without “on” or “off” to just show the Ethernet monitor status.

```
ves-100>vdsl enet monitor 2
enet monitor flag: off
```

Figure 12-11 Ethernet Monitor Status

```
>vdsl enet mon 2 on

ves-100>108:Enet(LT):Tx(F:0 B:0 S:0) Rx(F:681 B:85833 S:1950)
109:Enet(NT):Tx(F:694 B:90140 S:2709) Rx(F:0 B:0 S:0)
113:Enet(LT):Tx(F:0 B:0 S:0) Rx(F:815 B:117449 S:6323)
114:Enet(NT):Tx(F:828 B:119529 S:5877) Rx(F:0 B:0 S:0)
118:Enet(LT):Tx(F:0 B:0 S:0) Rx(F:876 B:125667 S:1643)
119:Enet(NT):Tx(F:884 B:126557 S:1405) Rx(F:0 B:0 S:0)
123:Enet(LT):Tx(F:0 B:0 S:0) Rx(F:934 B:134174 S:1701)
124:Enet(NT):Tx(F:943 B:134941 S:1676) Rx(F:0 B:0 S:0)
128:Enet(LT):Tx(F:0 B:0 S:0) Rx(F:980 B:138422 S:849)

ves-100>vdsl enet mon off
129:Enet(NT):Tx(F:989 B:139256 S:863) Rx(F:0 B:0 S:0)
```

Figure 12-12 Enet Monitor Statistics

Table 12-H Enet Monitor Statistics

LABEL	DESCRIPTION
LT	This is the VES-1000 Series switch.
NT	This is the subscriber's VDSL modem (P841).
TxF and RxF	Transmitting and Receiving Frame count.
TxB and RxB	Transmitting and Receiving Byte count.
TxS and RxS	Transmitting and Receiving Throughput in Bytes per second.

12.3.6 VDSL Enet Phy Command

`vdsl enet phy chan-id`

This command shows Ethernet PHY registers information in hexadecimal format.

```
ves-100>vdsl enet phy 1
LT Ethernet PHY Registers:
(00) 0x3100 (01) 0x7809 (02) 0x0016 (03) 0xf880 (04) 0x05e1 (05) 0x0000
(06) 0xffff (07) 0xffff (08) 0xffff (09) 0xffff (10) 0xffff (11) 0xffff
(12) 0xffff (13) 0xffff (14) 0xffff (15) 0xffff (16) 0x0022 (17) 0xff40
(18) 0x40a0 (19) 0xffc0 (20) 0x00a0 (21) 0xffff (22) 0xffff (23) 0xffff
(24) 0xffff (25) 0xffff (26) 0xffff (27) 0xffff (28) 0xffff (29) 0xffff

ves-100>
```

Figure 12-13 Ethernet Physical Registers

Chapter 13
Switch-Related Commands

This chapter shows you how to configure your VES-1000 Series switch using switch-related commands.

13.1 Overview

The following table is an overview of the MIB, port and VLAN switch-related CI commands.

Table 13-A MIB, Port and VLAN Switch Command Summary

COMMAND	DESCRIPTION	EXAMPLE
`sw mib status`	Use this command to see the port n mib counters.	`sw mib view n`
`sw mib clear`	Use this command to clear port n of mib counters.	`sw mib clear n`
`sw port status`	Use this command to see the link status of all ports.	`sw port status`
`sw vlan status`	Use this command to view all VLAN settings.	`sw vlan status`
`sw vlan set`	Use this command to set port(s) x1, x2, etc. to be the egress port(s) (outgoing ports) for port “n”.	`sw vlan set n, x1, x2`
`sw vlan clear`	Use this command to clear the VLAN setting of port n.	`sw vlan clear n`

13.2 Switch MIB Commands

The following are the most common MIB CI commands.

13.2.1 MIB Status Command

`sw mib status n`

This command allows you to view the MIB of port “n” where “n” is a port number.

`sw mib status 13` Displays the MIB of port 13 as follows:

```
Port13 statics:
00 RxUcstPkts     = 0                  01 RxBcstPkts     = 0
02 RxMcstPkts     = 0                  03 RxPausePkts    = 0
04 RxFCSErrors    = 0                  05 Collisions0    = 0
06 Collisions1    = 0                  07 MultiCollision = 0
08 TxUcstPkts     = 0                  09 TxBcstPkts     = 0
0a TxMcstPkts     = 0                  0b TxPausePkts    = 0
0c FloodPkts      = 0                  0d FilterPkts     = 0
0e BufFullDrops   = 0                  0f StormDrops     = 0
10 Rx64Octets     = 0                  11 Rx65To127      = 0
12 Rx128To255     = 0                  13 Rx256To511     = 0
14 Rx512To1023    = 0                  15 Rx1024ToMAX    = 0
16 TxExcessCOLs   = 0                  17 TxLateCOLs     = 0
18 Tx64Bytes      = 0                  19 Tx65To127      = 0
1a Tx128To255     = 0                  1b Tx256To511     = 0
1c Tx512To1023    = 0                  1d Tx1024ToMAX    = 0
1e RxOctetsMSB    = 0                  1f RxOctetsLSB    = 0
20 TxOctetsMSB    = 0                  21 TxOctetsLSB    = 0
22 RxFragments    = 0                  23 RxJabbers      = 0
24 RxAlignErrors  = 0                  25 RxSymbolErrors = 0
26 SecurityDrops  = 0                  27 VLANDrops      = 0
28 UndersizedPkt  = 0                  29 OversizedPkt   = 0
2a TxOversizePkt  = 0
Test>
```

Figure 13-1 Port Statistics

Please see *Table 9-B* for more information on these fields.

13.2.2 MIB Clear Command

`sw mib clear n`

This command allows you to clear the MIB counters of port “n” where “n” is a port number.

`sw mib clear 13` Clears port 13 of all MIB counters.

13.3 Port Status Command

`sw port status`

This command allows you to view the link status of all ports.

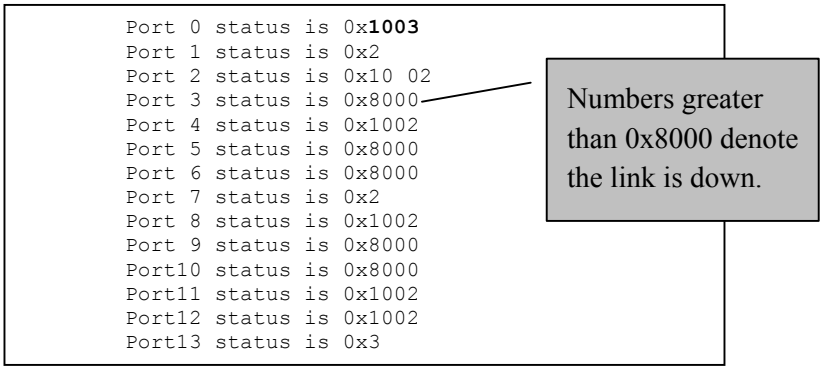
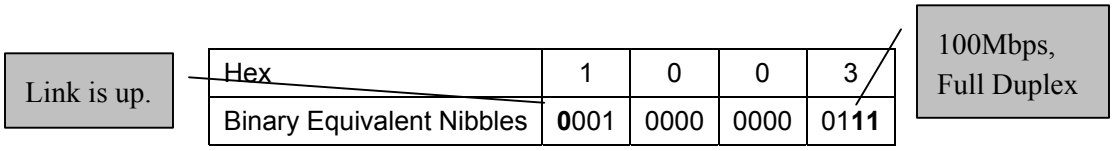

Port 0 status is 0x1003
Port 1 status is 0x2
Port 2 status is 0x10 02
Port 3 status is 0x8000
Port 4 status is 0x1002
Port 5 status is 0x8000
Port 6 status is 0x8000
Port 7 status is 0x2
Port 8 status is 0x1002
Port 9 status is 0x8000
Port10 status is 0x8000
Port11 status is 0x1002
Port12 status is 0x1002
Port13 status is 0x3
Numbers greater than 0x8000 denote the link is down.

Figure 13-2 Port Status Command

“0x” denotes a hexadecimal number. Let’s look at the bolded number (1003) in *Figure 13-2*.

Bits of interest are described as follows. Four binary bits (a nibble) make up each hex digit[1]. The leftmost bit in the first nibble denotes if the link is down or up. “0” means the link is up, “1” means the link is down.



The rightmost bit-pair in the last nibble show rate and duplex mode as described in the next table.

Table 13-B Port Status Command

LAST HEX DIGIT	RIGHTMOST NIBBLE BIT-PAIR	RATE	DUPLEX MODE
0	00	10Mbps	Half Duplex
1	01	10Mbps	Full Duplex
2	10	100Mbps	Half Duplex
3	11	100Mbps	Full Duplex

13.4VLANs

Please refer to *section 4.2.8* for some background information on VLANs in general.

The factory default port-based VLAN settings for VES-1000 Series switch are summarized below (see also *Figure 13-3)*:

- Port 0 (the CPU management port) forms a VLAN with all VDSL ports and can use the Ethernet port(s) as the uplink.
- The VDSL ports cannot talk to each other.
- Each VDSL port forms a VLAN with each Ethernet port and vice versa.

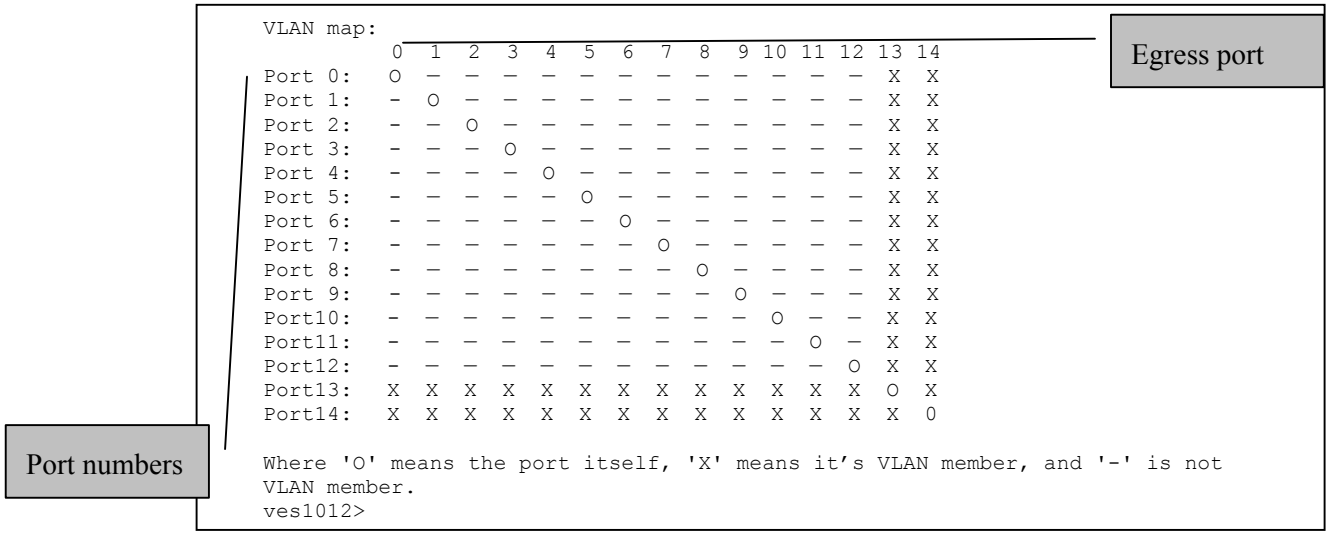
13.4.1 VLAN Status Command

```
sw vlan status
```

Use this command to view the port-based VLAN settings for all ports.

The factory default port-based VLAN for the VES-1000 Series switch is shown in the next screen.

[1] 0x2 = 0x0002




```
VLAN map:
          0  1  2  3  4  5  6  7  8  9 10 11 12 13 14
Port 0:   O  -  -  -  -  -  -  -  -  -  -  -  -  X  X
Port 1:   -  O  -  -  -  -  -  -  -  -  -  -  -  X  X
Port 2:   -  -  O  -  -  -  -  -  -  -  -  -  -  X  X
Port 3:   -  -  -  O  -  -  -  -  -  -  -  -  -  X  X
Port 4:   -  -  -  -  O  -  -  -  -  -  -  -  -  X  X
Port 5:   -  -  -  -  -  O  -  -  -  -  -  -  -  X  X
Port 6:   -  -  -  -  -  -  O  -  -  -  -  -  -  X  X
Port 7:   -  -  -  -  -  -  -  O  -  -  -  -  -  X  X
Port 8:   -  -  -  -  -  -  -  -  O  -  -  -  -  X  X
Port 9:   -  -  -  -  -  -  -  -  -  O  -  -  -  X  X
Port10:   -  -  -  -  -  -  -  -  -  -  O  -  -  X  X
Port11:   -  -  -  -  -  -  -  -  -  -  -  O  -  X  X
Port12:   -  -  -  -  -  -  -  -  -  -  -  -  O  X  X
Port13:   X  X  X  X  X  X  X  X  X  X  X  X  X  O  X
Port14:   X  X  X  X  X  X  X  X  X  X  X  X  X  X  0

Where 'O' means the port itself, 'X' means it's VLAN member, and '-' is not
VLAN member.
ves1012>
```

Figure 13-3 Default VLAN Settings

In this example, port 0 is the CPU port, ports 1 to 12 are the VDSL ports and ports 13 and 14 are the Ethernet ports. The numbers in the top row denote the outgoing port for the corresponding port listed on the left (its egress port).

This example details the VLAN settings for the VES-1012 Ethernet switch. The VES-1008 is identical however the number of ports will only show from Ports 1-10.

Table 13-C VLAN Key

SYMBOL	DESCRIPTION
-	A hyphen denotes that this port is not a member of the associated VLAN group.
0	A zero denotes the port itself.
X	An "X" indicates a port's egress (outgoing port).

To allow two subscriber ports to talk to each other, you must define the egress for both ports.

If you wish to daisy-chain the VES-1000 Series switch with for example, port 13 as the daisy-chain port (using a crossover Ethernet cable) and port 14 as the uplink port (using a straight-through Ethernet cable), then you should change the VLAN status to the following:

```
VLAN map:
          0  1  2  3  4  5  6  7  8  9 10 11 12 13 14
Port 0:  O  -  -  -  -  -  -  -  -  -  -  -  -  -  X
Port 1:  -  O  -  -  -  -  -  -  -  -  -  -  -  -  X
Port 2:  -  -  O  -  -  -  -  -  -  -  -  -  -  -  X
Port 3:  -  -  -  O  -  -  -  -  -  -  -  -  -  -  X
Port 4:  -  -  -  -  O  -  -  -  -  -  -  -  -  -  X
Port 5:  -  -  -  -  -  O  -  -  -  -  -  -  -  -  X
Port 6:  -  -  -  -  -  -  O  -  -  -  -  -  -  -  X
Port 7:  -  -  -  -  -  -  -  O  -  -  -  -  -  -  X
Port 8:  -  -  -  -  -  -  -  -  O  -  -  -  -  -  X
Port 9:  -  -  -  -  -  -  -  -  -  O  -  -  -  -  X
Port10:  -  -  -  -  -  -  -  -  -  -  O  -  -  -  X
Port11:  -  -  -  -  -  -  -  -  -  -  -  O  -  -  X
Port12:  -  -  -  -  -  -  -  -  -  -  -  -  O  -  X
Port13:  -  -  -  -  -  -  -  -  -  -  -  -  -  O  X
Port14:  X  X  X  X  X  X  X  X  X  X  X  X  X  X  O

Where 'O' means the port itself, 'X' means its VLAN member, and '-' is not VLAN
member.
```

Figure 13-4 Daisy-chaining VLAN Example

13.4.2 VLAN Set Command

Set Specific Egress Ports for a Port

`sw vlan set n x1 x2`

Use this command to set port(s) x1, x2, etc. to be the egress port(s) for port n. For example:

`sw vlan set 1 3 4` Sets ports 3 and 4 to be the egress ports for port 1.

This is shown in the next figure.

Note that if ports 5, 6 and 7 were already egress ports for port 1 (previous to this command), issuing “sw vlan set 1 3 4” would not affect these and they would remain port 1 egress ports.

Enter “sw vlan status” to see the result of this command.

```
VLAN map:
         0  1  2  3  4  5  6  7  8  9 10 11 12 13 14
Port 0:  O  -  -  -  -  -  -  -  -  -  -  -  -  X  X
Port 1:  -  O  -  X  X  -  -  -  -  -  -  -  -  X  X
Port 2:  -  -  O  -  -  -  -  -  -  -  -  -  -  X  X
Port 3:  -  -  -  O  -  -  -  -  -  -  -  -  -  X  X
Port 4:  -  -  -  -  O  -  -  -  -  -  -  -  -  X  X
Port 5:  -  -  -  -  -  O  -  -  -  -  -  -  -  X  X
Port 6:  -  -  -  -  -  -  O  -  -  -  -  -  -  X  X
Port 7:  -  -  -  -  -  -  -  O  -  -  -  -  -  X  X
Port 8:  -  -  -  -  -  -  -  -  O  -  -  -  -  X  X
Port 9:  -  -  -  -  -  -  -  -  -  O  -  -  -  X  X
Port10:  -  -  -  -  -  -  -  -  -  -  O  -  -  X  X
Port11:  -  -  -  -  -  -  -  -  -  -  -  O  -  X  X
Port12:  -  -  -  -  -  -  -  -  -  -  -  -  O  X  X
Port13:  X  X  X  X  X  X  X  X  X  X  X  X  X  O  X
Port14:  X  X  X  X  X  X  X  X  X  X  X  X  X  O  X

Where 'O' means the port itself, 'X' means its VLAN member, and '-' is not VLAN
member.
```

Figure 13-5 VLAN Set Example

Port 1 can now talk to ports 3 and 4, but ports 3 and 4 cannot talk to port 1. Set port 1 to be the egress port for each of ports 3 and 4 (using the “sw vlan set” command) so that they may also talk to port 1 giving a symmetrical table as shown in the next figure.

`Sw vlan set 3 1`	Sets port 1 to be the egress port for port 3.
`Sw vlan set 4 1`	Sets port 1 to be the egress port for port 4.

```
VLAN map:
         0  1  2  3  4  5  6  7  8  9 10 11 12 13 14
Port 0:  O  -  -  -  -  -  -  -  -  -  -  -  -  X  X
Port 1:  -  O  -  X  X  -  -  -  -  -  -  -  -  X  X
Port 2:  -  -  O  -  -  -  -  -  -  -  -  -  -  X  X
Port 3:  -  X  -  O  -  -  -  -  -  -  -  -  -  X  X
Port 4:  -  X  -  -  O  -  -  -  -  -  -  -  -  X  X
Port 5:  -  -  -  -  -  O  -  -  -  -  -  -  -  X  X
Port 6:  -  -  -  -  -  -  O  -  -  -  -  -  -  X  X
Port 7:  -  -  -  -  -  -  -  O  -  -  -  -  -  X  X
Port 8:  -  -  -  -  -  -  -  -  O  -  -  -  -  X  X
Port 9:  -  -  -  -  -  -  -  -  -  O  -  -  -  X  X
Port10:  -  -  -  -  -  -  -  -  -  -  O  -  -  X  X
Port11:  -  -  -  -  -  -  -  -  -  -  -  O  -  X  X
Port12:  -  -  -  -  -  -  -  -  -  -  -  -  O  X  X
Port13:  X  X  X  X  X  X  X  X  X  X  X  X  X  O  X
Port14:  X  X  X  X  X  X  X  X  X  X  X  X  X  O  X

Where 'O' means the port itself, 'X' means its VLAN member, and '-' is not VLAN
member.
```

Figure 13-6 VLAN Set Example 2

Set All Ports to be Egress Ports for a Port

```
sw vlan set n all
```

Use this command to set all ports (in this example, 0 to 14) to be the egress ports for port n. For example:

`sw vlan set 1 all`	Sets all ports to be the egress ports for port 1.

```
VLAN map:
          0  1  2  3  4  5  6  7  8  9 10 11 12 13 14
Port 0:   O  -  -  -  -  -  -  -  -  -  -  -  -  X  X
Port 1:   X  O  X  X  X  X  X  X  X  X  X  X  X  X  X
Port 2:   -  -  O  -  -  -  -  -  -  -  -  -  -  X  X
Port 3:   -  X  -  O  -  -  -  -  -  -  -  -  -  X  X
Port 4:   -  X  -  -  O  -  -  -  -  -  -  -  -  X  X
Port 5:   -  -  -  -  -  O  -  -  -  -  -  -  -  X  X
Port 6:   -  -  -  -  -  -  O  -  -  -  -  -  -  X  X
Port 7:   -  -  -  -  -  -  -  O  -  -  -  -  -  X  X
Port 8:   -  -  -  -  -  -  -  -  O  -  -  -  -  X  X
Port 9:   -  -  -  -  -  -  -  -  -  O  -  -  -  X  X
Port10:   -  -  -  -  -  -  -  -  -  -  O  -  -  X  X
Port11:   -  -  -  -  -  -  -  -  -  -  -  O  -  X  X
Port12:   -  -  -  -  -  -  -  -  -  -  -  -  O  X  X
Port13:   X  X  X  X  X  X  X  X  X  X  X  X  X  O  X
Port14:   X  X  X  X  X  X  X  X  X  X  X  X  X  O  X

Where 'O' means the port itself, 'X' means its VLAN member, and '-' is not VLAN
member.
```

Figure 13-7 Set All Ports As Egress Ports for a Single Port

Set All Ports to be Egress Ports for All Ports

```
sw vlan set all
```

Use this command to set all ports (in this example, 0 to 14) to be the egress ports for all ports (0 to 14). This is effect disables VLAN and has security ramifications for VDSL subscribers.

```
VLAN map:
          0  1  2  3  4  5  6  7  8  9 10 11 12 13 14
Port 0:   O  X  X  X  X  X  X  X  X  X  X  X  X  X  X
Port 1:   X  O  X  X  X  X  X  X  X  X  X  X  X  X  X
Port 2:   X  X  O  X  X  X  X  X  X  X  X  X  X  X  X
Port 3:   X  X  X  O  X  X  X  X  X  X  X  X  X  X  X
Port 4:   X  X  X  X  O  X  X  X  X  X  X  X  X  X  X
Port 5:   X  X  X  X  X  O  X  X  X  X  X  X  X  X  X
Port 6:   X  X  X  X  X  X  O  X  X  X  X  X  X  X  X
Port 7:   X  X  X  X  X  X  X  O  X  X  X  X  X  X  X
Port 8:   X  X  X  X  X  X  X  X  O  X  X  X  X  X  X
Port 9:   X  X  X  X  X  X  X  X  X  O  X  X  X  X  X
Port10:   X  X  X  X  X  X  X  X  X  X  O  X  X  X  X
Port11:   X  X  X  X  X  X  X  X  X  X  X  O  X  X  X
Port12:   X  X  X  X  X  X  X  X  X  X  X  X  O  X  X
Port13:   X  X  X  X  X  X  X  X  X  X  X  X  X  O  X
Port14:   X  X  X  X  X  X  X  X  X  X  X  X  X  X  O

Where 'O' means the port itself, 'X' means its VLAN member, and '-' is not VLAN
member.
```

Figure 13-8 Set All VLAN Ports

13.4.3 VLAN Clear Command

Clear One Port of Specific Egress Ports

```
sw vlan clear n x1 x2
```

Use this command to clear port n of egress ports x1 and x2.

```
Sw vlan clear 1 3 4
```
Clears port 1 of egress ports 3 and 4.

This command only clears the egress ports you specify.

Enter “sw vlan status” to see the result of this command.

```
VLAN map:
         0  1  2  3  4  5  6  7  8  9 10 11 12 13 14
Port 0:  O  X  X  X  X  X  X  X  X  X  X  X  X  X  X
Port 1:  X  O  X  -  -  X  X  X  X  X  X  X  X  X  X
Port 2:  X  X  O  X  X  X  X  X  X  X  X  X  X  X  X
Port 3:  X  X  X  O  X  X  X  X  X  X  X  X  X  X  X
Port 4:  X  X  X  X  O  X  X  X  X  X  X  X  X  X  X
Port 5:  X  X  X  X  X  O  X  X  X  X  X  X  X  X  X
Port 6:  X  X  X  X  X  X  O  X  X  X  X  X  X  X  X
Port 7:  X  X  X  X  X  X  X  O  X  X  X  X  X  X  X
Port 8:  X  X  X  X  X  X  X  X  O  X  X  X  X  X  X
Port 9:  X  X  X  X  X  X  X  X  X  O  X  X  X  X  X
Port10:  X  X  X  X  X  X  X  X  X  X  O  X  X  X  X
Port11:  X  X  X  X  X  X  X  X  X  X  X  O  X  X  X
Port12:  X  X  X  X  X  X  X  X  X  X  X  X  O  X  X
Port13:  X  X  X  X  X  X  X  X  X  X  X  X  X  O  X
Port14:  X  X  X  X  X  X  X  X  X  X  X  X  X  X  O

Where 'O' means the port itself, 'X' means its VLAN member, and '-' is not VLAN
member.
```

Figure 13-9 Clear One Port of Specific Egress Ports

Clear One Port of All Egress Ports

```
sw vlan clear n all
```

Use this command to clear port n of all egress ports.

```
Sw vlan clear 1 all
```
Clears port 1 of all egress ports.

Enter “sw vlan status” to see the result of this command.

```
VLAN map:
         0  1  2  3  4  5  6  7  8  9 10 11 12 13 14
Port 0:  O  X  X  X  X  X  X  X  X  X  X  X  X  X  X
Port 1:  -  O  -  -  -  -  -  -  -  -  -  -  -  -  -
Port 2:  X  X  O  X  X  X  X  X  X  X  X  X  X  X  X
Port 3:  X  X  X  O  X  X  X  X  X  X  X  X  X  X  X
Port 4:  X  X  X  X  O  X  X  X  X  X  X  X  X  X  X
Port 5:  X  X  X  X  X  O  X  X  X  X  X  X  X  X  X
Port 6:  X  X  X  X  X  X  O  X  X  X  X  X  X  X  X
Port 7:  X  X  X  X  X  X  X  O  X  X  X  X  X  X  X
Port 8:  X  X  X  X  X  X  X  X  O  X  X  X  X  X  X
Port 9:  X  X  X  X  X  X  X  X  X  O  X  X  X  X  X
Port10:  X  X  X  X  X  X  X  X  X  X  O  X  X  X  X
Port11:  X  X  X  X  X  X  X  X  X  X  X  O  X  X  X
Port12:  X  X  X  X  X  X  X  X  X  X  X  X  O  X  X
Port13:  X  X  X  X  X  X  X  X  X  X  X  X  X  O  X
Port14:  X  X  X  X  X  X  X  X  X  X  X  X  X  X  O

Where 'O' means the port itself, 'X' means its VLAN member, and '-' is not VLAN
member.
```

Figure 13-10 Clear One Port of All Egress Ports

Clear All Ports of All Egress Ports

```
sw vlan clear all
```

Use this command to clear all ports of all egress ports.

`Sw vlan clear all`	Clears all ports of all egress ports.

Enter “sw vlan status” to see the result of this command.

```
VLAN map:
         0  1  2  3  4  5  6  7  8  9 10 11 12 13 14
Port 0:  O  -  -  -  -  -  -  -  -  -  -  -  -  -  -
Port 1:  -  O  -  -  -  -  -  -  -  -  -  -  -  -  -
Port 2:  -  -  O  -  -  -  -  -  -  -  -  -  -  -  -
Port 3:  -  -  -  O  -  -  -  -  -  -  -  -  -  -  -
Port 4:  -  -  -  -  O  -  -  -  -  -  -  -  -  -  -
Port 5:  -  -  -  -  -  O  -  -  -  -  -  -  -  -  -
Port 6:  -  -  -  -  -  -  O  -  -  -  -  -  -  -  -
Port 7:  -  -  -  -  -  -  -  O  -  -  -  -  -  -  -
Port 8:  -  -  -  -  -  -  -  -  O  -  -  -  -  -  -
Port 9:  -  -  -  -  -  -  -  -  -  O  -  -  -  -  -
Port10:  -  -  -  -  -  -  -  -  -  -  O  -  -  -  -
Port11:  -  -  -  -  -  -  -  -  -  -  -  O  -  -  -
Port12:  -  -  -  -  -  -  -  -  -  -  -  -  O  -  -
Port13:  -  -  -  -  -  -  -  -  -  -  -  -  -  O  -
Port14:  -  -  -  -  -  -  -  -  -  -  -  -  -  -  O

Where 'O' means the port itself, 'X' means its VLAN member, and '-' is not VLAN
member.
```

Figure 13-11 Clear All VLAN Ports

13.5MAC Address Commands

The following commands allow ports to learn MAC addresses and display information about MAC addresses learned. MAC address learning reduces the need for outgoing traffic broadcasts.

Table 13-D MAC Address CI Commands

COMMAND	DESCRIPTION	EXAMPLE
`sw mac status`	Use this command to see which ports may learn MAC addresses.	`sw mac status`
`sw mac learn n on|off`	Use this command to allow or disallow port n from learning MAC addresses.	`sw mac learn 1 on`
`sw mac address`	Use this command to see all MAC addresses learned.	`sw mac address`
`sw mac num`	Use this command to view the total number of learned MAC addresses.	`sw mac num`
`sw mac find`	Use this command to find a MAC address and display port interface and age information.	`sw mac find 00:80:c8:3d:35:5d`

13.5.1 MAC Learning Status

`sw mac status`

This command displays ports that may learn MAC addresses.

```
VES_APLHA> sw mac status

Port  1 MAC learning operation : Enabled
Port  2 MAC learning operation : Enabled
Port  3 MAC learning operation : Enabled
Port  4 MAC learning operation : Enabled
Port  5 MAC learning operation : Enabled
Port  6 MAC learning operation : Enabled
Port  7 MAC learning operation : Enabled
Port  8 MAC learning operation : Enabled
Port  9 MAC learning operation : Enabled
Port 10 MAC learning operation : Enabled
Port 11 MAC learning operation : Enabled
Port 12 MAC learning operation : Enabled
Port 13 MAC learning operation : Enabled
Port 14 MAC learning operation : Enabled
CAUTION: For actual MAC address learning to occur on a port, Active must be
set to Yes in Menu 6 - Ports Setup for that port.
VES APLHA>
```

Figure 13-12 MAC Learning Status

From this screen we see that all ports have MAC learning enabled by default.

For actual MAC address learning to occur on a port, Active **must be set to** Yes **in** Menu 6 — Ports Setup **for that port.**

13.6 MAC Address Learning

To disallow port 1 from learning MAC addresses use this command.

`sw mac learn 1 off`	This command turns MAC address learning off for port 1.
`sw mac status`	Type this command to see the result.

```
VES_APLHA> sw mac status

Port  1 MAC learning operation : Disabled
Port  2 MAC learning operation : Enabled
Port  3 MAC learning operation : Enabled
Port  4 MAC learning operation : Enabled
Port  5 MAC learning operation : Enabled
Port  6 MAC learning operation : Enabled
Port  7 MAC learning operation : Enabled
Port  8 MAC learning operation : Enabled
Port  9 MAC learning operation : Enabled
Port 10 MAC learning operation : Enabled
Port 11 MAC learning operation : Enabled
Port 12 MAC learning operation : Enabled
Port 13 MAC learning operation : Enabled
Port 14 MAC learning operation : Enabled
CAUTION: For actual MAC address learning to occur on a port, Active must be
set to Yes in Menu 6 - Ports Setup for that port.
VES_APLHA>
```

Figure 13-13 Set Port 1 To Learn MAC Addresses

13.6.1 MAC Address Details

`sw mac address` Type this command to see details of all MAC addresses learned.

```
VES_APLHA>sw mac address
age   ifport     address
10    14         00:05:5d:04:14:ac:          0  14    00:00:e8:89:89:47:
0     14         00:90:cc:a6:24:dc:          6  14    00:80:c8:29:29:99:
18    14         00:80:c8:55:29:9e:          4  14    08:00:09:bd:e1:97:
4     14         00:a0:cc:3e:a6:a8:          6  14    00:03:47:70:2d:b0:
2     14         00:a0:c9:03:ab:93:          6  14    00:80:c8:36:ad:4a:
0     14         00:80:c8:2e:2d:a1:         2  14    00:d0:59:0d:9c:ed:
12    14         00:a0:c5:99:30:bf:          0  14    00:a0:c5:78:31:26:
< press [ENTER] to continue displaying MAC addresses learned (you may have to do this
several times to complete) or press [ESC] to return to the CI command prompt >
age    ifport             address
12    14         00:50:8b:aa:6c:72:          0  14    00:00:e2:34:16:c1:
20    14         00:a0:c5:12:34:56:          0  14    00:60:97:9c:62:94:
0     14         00:a0:c5:20:b5:88:          2  14    00:90:cc:a6:2e:40:
8     14         00:20:e0:63:1b:a6:         1  14    00:50:ba:22:c2:10:
16    14         00:80:c8:ba:b4:13:          4  14    00:10:83:93:f9:df:
8     14         00:00:86:46:f7:72:          0  14    00:05:5d:04:21:17:
0     14         00:80:c8:19:35:a8:         1  14    00:05:5d:03:a1:60:
2     14         00:c0:26:ba:57:19:          8  14    00:10:b5:52:c9:60:
0     14         00:10:b5:52:c9:63:          6  14    00:80:c8:64:b6:2a:
2     14         00:10:b5:52:c9:bc:         1  14    00:80:c8:91:b6:69:
0     14         00:05:5d:04:22:cd:
Total MAC address num = 315
VES APLHA>
```

Figure 13-14 MAC Address Details

Table 13-E MAC Address Details

FIELD	DESCRIPTION
Age	MAC addresses older than 300 seconds are deleted if there are no more incoming packets from this address.
ifport	This is the incoming port that the packet with this MAC address came from.
address	This is the MAC address learned.
Total MAC address num	This is the total number of MAC addresses learned.
Press [ENTER] to continue displaying MAC addresses learned (you may have to do this several times) or press [ESC] to return to the CI command prompt.	

13.6.2 MAC Number

To view the total number of MAC addresses learned (and not the details shown in the previous command) use the following command.

`sw mac mum` This displays the total number of MAC addresses learned.

```
VES_APLHA> sw mac num

Num of learned MAC address = 328
```

Figure 13-15 Total Number of MAC Addresses Learned

13.6.3 Switch MAC Find Command

`sw mac find (mac address)`

Use this command to find a MAC address and display port interface and age information.

```
switch mac find 00:80:c8:3d:35:5d
ret = 1
ifport = 13, age = 2, static = 0
```

Figure 13-16 Find MAC Address Example

Table 13-F Find MAC Address Example

FIELD	DESCRIPTION
Ret	This is the number of entries returned for this MAC address in the mAC Address learning table.
Ifport	This is the incoming port that the packet with this MAC address came from.
Age	This is how many seconds this MAC address has been in the MAC address learning table.
Static	“0” is a dynamic MAC address that is a MAC address that has been learned. Learned MAC addresses older than 300 seconds are deleted if there are no more incoming packets from this address. “1” is a static MAC address that has been manual entered in the MAC address learning table. Static MAC addresses do not age out.

13.7 Switch Spanning Tree Protocol Command

`sw stp disp`

Use this command to display the Spanning Tree Protocol (STP) status. You see the following screen if STP is not enabled on the switch.

```
ves-100> sw stp disp
Spanning Tree Protocol is down
```

Figure 13-17 STP Status Down

You’ll see a screen similar to the following one if STP is enabled.

```
Bridge Info:
     (1) DesignatedRootBridgeID:           8000-00a0c5012345
     (2) RootPathCost:                     0
     (3) RootPortID:                       0x0000
     (4) MaxAge:                           5120 (1/256 sec)
     (5) HelloTime:                        512 (1/256 sec)
     (6) ForwardDelay:                     3840 (1/256 sec)
     (7) BridgeID:                         8000-00a0c5012345
     (8) BMaxAge:                          5120 (1/256 sec)
     (9) BHelloTime:                       512 (1/256 sec)
     (10) BForwardDelay:                   3840 (1/256 sec)
     (11) TopologyCgangeDetected:          0
     (12) TopologyChange:                  0
     (13) TopologyChangeTime:              8960 (1/256 sec)
     (14) HoldTime:                        256 (1/256 sec)
Port_0 Info:
     (1) Port ID:                          0x8000
     (2) Port State:                       4
     (3) Enable:                           1
     (4) PathCost:                         100
     (5) Designated Root:                  8000-00a0c5012345
     (6) Designated Cost:                  0
     (7) Designated Bridge:                8000-00a0c5012345
     (8) Designated Port:                  0x8000
     (9) TopologyChangeAcknowledge:        0
     (10)ConfigPending:                    0
     (11) ForwardTransition:               1
STP Counter:
     SendConfCount:                        262
     SendTCNCount:                         0
     RecConfigBPDU:                        0
     RecTCNBPDU:                           0
```

Figure 13-18 STP Counter Display Example

Refer to *Table 9-C* for information on the fields displayed.

13.8 Switch Driver Commands

The following table shows the switch driver commands supported by the VES-1000 Series switch.

Table 13-G Switch Driver Commands

COMMAND	DESCRIPTION
switch driver count disp	This command shows the switch counter.
switch driver count clear	This command clears the switch counters.

13.8.1 Display Switch Driver Counter Command

```
sw driver count disp
```

Use this command to show NDIS-level (Network Driver Interface Specification, a network interface card specification) counters.

```
ves-100> switch driver count disp
TxPktCnt     = 79287    RxPktCnt   = 281259
TxBufFullCnt = 0        RxNoBufCnt = 0
TxFreeCnt    = 79287
```

Figure 13-19 Display Switch Driver Counters

Table 13-H Display Switch Driver Counters

FIELD	DESCRIPTION
TxPktCnt	This is the number of transmitted packets.
RxPktCnt	This is the number of received packets.
TxBufFullCnt	This is the number of buffer allocation failures while transmitting packets.
RxNoBufCnt	This is the number of buffer allocation failures while receiving packets.
TxFreeCnt	This is the number of free buffers after packet transmission.

13.8.2 Switch Driver Clear Counters Command

`switch driver count clear`

Use this command to clear all NDIS-level (Network Driver Interface Specification, a network interface card specification) counters.

Chapter 14
IP Commands

This chapter discusses configuring the VES-1000 Series switch using IP commands.

14.1 Introduction

Traditionally, IP packets are transmitted in one of either two ways - Unicast (1 sender to 1 recipient) or Broadcast (1 sender to everybody on the network). Multicast delivers IP packets to just a group of hosts on the network.

IGMP (Internet Group Multicast Protocol) is a session-layer protocol used to establish membership in a multicast group - it is not used to carry user data. Refer to *RFC 1112* and *RFC 2236* for information on IGMP versions 1 and 2 respectively.

A layer-2 switch can passively snoop on IGMP Query, Report and Leave (IGMP version 2) packets transferred between IP multicast routers/switches and IP multicast hosts to learn the IP multicast group membership. It checks IGMP packets passing through it, picks out the group registration information, and configures multicasting accordingly.

Without IGMP snooping, multicast traffic is treated in the same manner as broadcast traffic, that is, it is forwarded to all ports. With IGMP snooping, group multicast traffic is only forwarded to ports that are members of that group. IGMP Snooping generates no additional network traffic, allowing you to significantly reduce multicast traffic passing through your switch.

The following table is a summary of the IGMP snooping IP commands supported. With IGMP snooping, group multicast traffic is only forwarded to ports that are members of that group. IGMP Snooping generates no additional network traffic, allowing you to significantly reduce multicast traffic passing through your switch. Please see *Table 4-B* for more information on IGMP snooping.

Table 14-A IP Commands Supported

COMMAND	DESCRIPTION
ip igmpsnoop status	This command shows IGMP snooping information such as status, packet counters and joined multicast groups.
ip igmpsnoop querier	This command shows the incoming channel from which the last query came.
ip igmpsnoop enable	This command turns on IGMP snooping.
ip igmpsnoop disable	This command turns off IGMP snooping.

14.1.1 IGMP Snooping Status

```
ip igmpsnoop status
```

Use this command to display whether IGMP snooping is enabled or disabled, IGMP packet counters (incoming IGMP queries, IGMP reports, and leave packets) and which multicast groups each port has joined.

```
ves-100> ip igmpsnoop status
IGMP Snooping: Enable
inQuery = 30          inReport = 170            inLeave = 3

Group             groupLink             channLink             flags
224.0.0.12       [0054a934 002a3480] [0074bab0 0074bab0] 0000
224.0.0.6        [0054ad10 0074f608] [0074ba08 0074ba08] 0000
224.0.0.5        [0054ac40 0054a934] [0074b9b4 0074b9b4] 0000
239.255.255.254 [0074f0f4 0054ad10] [0074b960 0074b960] 0000
224.0.0.9        [0074f878 0054ac40] [0074b90c 0074b8b8] 0000
224.0.1.24       [0074ea0c 0074f0f4] [0074b864 0074b864] 0000
224.0.0.2        [0074ef88 0074f878] [0074b810 0074b810] 0000
239.255.255.250 [0074f8e0 0074ea0c] [0074ba5c 0074b7bc] 0000
224.0.1.60       [0074f08c 0074ef88] [0074b768 0074b768] 0000
224.0.1.22       [002a3480 0074f8e0] [0074b714 0074b714] 0000

channel swp00 flags 00000000
  multicast group:
        .
        .
        .
channel swp12 flags 00000000
  multicast group:
  224.0.0.12      224.0.0.6       224.0.0.5       239.255.255.254
  224.0.0.9       224.0.1.24      224.0.0.2       239.255.255.250
  224.0.1.60      224.0.1.22

channel swp13 flags 00000000
  multicast group:
  239.255.255.250 224.0.0.9
```

Figure 14-1 IGMP Snooping Status

Table 14-B IGMP Snooping Status

FIELD	DESCRIPTION
IGMP Snooping	This field shows whether IGMP snooping is enabled on the device or not. If enabled, the device monitors network traffic to determine which hosts want to receive multicast traffic.
inQuery	This field displays the number of incoming IGMP queries.
inReport	This field displays the number of incoming IGMP reports.
inLeave	This field displays the number of incoming IGMP leave messages.
Group	This is the group multicast IP address.
groupLink channLink Flags	These fields are for debug purposes only. Send a screen shot of this screen to your nearest customer support if there are problems with IGMP snooping on your device.
channel multicast group:	These fields display what multicast groups belong to a channel.

14.1.2 IGMP Snooping Queries

```
ip igmpsnoop querier
```

This command displays the incoming channel from which the last query came.

```
ves-100> ip igmpsnoop querier
Last query is received from channel swp12
```

Figure 14-2 IGMP Snooping Query Example

14.1.3 Enable IGMP Snooping

```
ip igmpsnoop enable
```

Use this command to turn on IGMP snooping.

14.1.4 Disable IGMP Snooping

```
ip igmpsnoop disable
```

Use this command to turn off IGMP snooping.

Chapter 15 Troubleshooting

This chapter covers potential problems and possible remedies. After each problem description, some steps are provided to help you diagnose and solve the problem. Refer to the Troubleshooting chapter in the Hardware Installation Guide for more troubleshooting information.

15.1 VDSL LED(s)

A VDSL LED is not on.

Table 15-A Troubleshooting the VDSL LED(s)

STEPS	CORRECTIVE ACTION
1	Disconnect the phone wire coming from the USER port of the VES-1000 Series switch and connect the VDSL modem or router directly to the USER port of the VES-1000 Series switch using a different telephone wire. If the LED turns on, check for a problem with the building's phone wire.
2	Set the VDSL modem to "auto-negotiate". If this is not possible, set it to 100 Mbps, half duplex mode.
3	Use the VDSL CI commands to reset and reconnect the VDSL channel (see *Chapter 12*).
4	If the LED remains off, contact the distributor.

15.2Data Transmission

The VDSL LED is on, but data cannot be transmitted.

Table 15-B Troubleshooting Data Transmission

STEPS	CORRECTIVE ACTION
1	Disconnect the phone wire coming from the USER port of the VES-1000 Series switch and connect the VDSL modem or router directly to the USER port of the VES-1000 Series switch using a different telephone wire. If data can be transmitted, check for a problem with the building's phone wire.
2	Check to see that you are using the correct VDSL mode (see *section 4.2.1*).
3	Check the VLAN configuration of the VES-1000 Series switch (see *section 13.4*).
4	Do a local and remote feedback test from menu 24.4 (see *section 9.5*)
5	Ping the VES-1000 Series switch from the user's computer.
6	If you cannot ping, connect the VDSL modem or router to another VES-1000 Series switch VDSL port. If the VDSL modem or router works with a different port, then there may be a problem with the original port. Contact the distributor.
7	If using a different port does not work, try a different VDSL modem or router with the original port.

15.3 Intermittent VDSL LED(s)

A VDSL LED turns on and off intermittently.

Table 15-C Troubleshooting a Non-Constant VDSL LED

STEPS	CORRECTIVE ACTION
1	Disconnect the phone wire coming from the USER port of the VES-1000 Series switch and connect the VDSL modem or router directly to the USER port of the VES-1000 Series switch using a different telephone wire. If the VDSL LED stays on, check for a problem with the building's phone wire.
2	Use the VDSL CI commands to reset and reconnect the VDSL channel (see *Chapter 12*).

15.4 Data Rate

The SYNC-rate is not the same as the configured rate.

Table 15-D Troubleshooting the SYNC-rate

STEPS	CORRECTIVE ACTION
1	Disconnect the phone wire coming from the USER port of the VES-1000 Series switch and connect the VDSL modem or router directly to the USER port of the VES-1000 Series switch using a different telephone wire. If the rates match, the regular phone wire quality may be limiting the speed (see *section 5.1*).
2	Do a local and remote feedback test from menu 24.4 (see *section 9.5*) to determine if there are problems with the telephone line.

15.5 Configured Settings

The VES-1000 Series switch's configured settings do not take effect at restart.

Table 15-E Troubleshooting the VES-1000 Series switch's Configured Settings

CORRECTIVE ACTION
After you finish configuring the settings using the SMT, remember to press [ENTER] at the prompt "Press ENTER to Confirm…" to save your configuration. All VDSL parameters and flags set using VDSL C/I commands are effective at run-time only. If you restart the VES-1000 Series switch, you will lose the configuration changes you made with CI commands. To save changes permanently, please use the appropriate SMT menu. If this does not work, contact the distributor.

15.6 Password

I forgot the password to my VES-1000 Series switch.

Table 15-F Troubleshooting the Password

STEPS	CORRECTIVE ACTION
1	Upload the default configuration file (see *section 3.4.1* and *Chapter 10*). All settings will return to the default value and previously saved configurations will be lost.
2	Send a screen shot of your VES-1000 Series switch's MAC address to your local distributor.

15.7 Remote Server

The computer behind the VDSL modem or router cannot access a remote server.

Table 15-G Troubleshooting a Remote Server

STEPS	CORRECTIVE ACTION
1	See *Table 15-B* to make sure that you are able to transmit to the VES-1000 Series switch.
2	Make sure the gateway's IP address is the same as the one configured in the user's computer.
3	Check the VLAN configuration of the Ethernet port on the VES-1000 Series switch (see *section 13.4*).
4	Check the Ethernet cable and connections between the VES-1000 Series switch and the gateway.
5	Try to access another remote server. If data can be transmitted to a different remote server, the remote server that could not be accessed may have a problem.

15.8 Telnet

I cannot telnet into the VES-1000 Series switch.

Table 15-H Troubleshooting Telnet

STEPS	CORRECTIVE ACTION
1	Make sure telnet service is not disabled in menu 24.11.
2	Check that the IP address(es) in the **Secured Client Sets** menu (menu 24.11.1) match the client IP address(es). If they do not match, the VES-1000 Series switch will disconnect the telnet session immediately.
3	Check that there is not an SMT console session running.
4	Make sure that a telnet session is not already operating. The VES-1000 Series switch will only accept one telnet session at a time.
5	Ping the VES-1000 Series switch from your computer. If you are able to ping the VES-1000 Series switch but are still unable to telnet, contact the distributor. If you cannot ping the VES-1000 Series switch, check the IP addresses in the VES-1000 Series switch and your computer. Make sure that both IP addresses are in the same subnet.
6	If you are attempting to telnet from the VDSL side of the VES-1000 Series switch, see *Table 15-B* to make sure that you can transmit data to the VES-1000 Series switch.
7	If you are attempting to telnet from the Ethernet side of the VES-1000 Series switch, check the Ethernet cable.

Table 15-H Troubleshooting Telnet

STEPS	CORRECTIVE ACTION
8	If these steps fail to correct the problem, contact the distributor.

15.9 Connecting to the WAN Switch

The VES-1000 Series switch cannot connect to the WAN switch.

Table 15-I Troubleshooting Connecting to the WAN Switch

STEPS	CORRECTIVE ACTION
1	Check your cable connections. Use a straight through Ethernet cable when connecting the VES-1000 Series switch to a WAN switch. Use a crossover Ethernet cable if you are daisy-chaining to other VES-1000 Series switches and make sure trunking is disabled.
2	If Ethernet port trunking is enabled (in SMT menu 2), make sure the WAN switch also supports Ethernet port trunking.
3	The factory default settings for the Ethernet port of the VES-1000 Series switch are: ➢ Speed: Auto ➢ Duplex: Auto ➢ Flow control: On ➢ Trunking: Disabled If the VES-1000 Series switch's auto-negotiation is turned off, an Ethernet port uses the pre-configured speed and duplex mode when making a connection, thus requiring you to make sure that the settings of the WAN switch Ethernet port are in the same order to connect.

Part VI:

Appendices and Index

This part lists some appendices and an index.

Appendix A
Hardware Specifications

VES-1008 Specifications

Physical Interfaces

- Compact A4-sized enclosure
- 10” 1U rack/wall mountable unit
- One Telco-50 connector for 8 ports to CPE and POTS/ISDN to MDF or CO
- One Console port for local management
- Two RJ-45 auto-negotiating 10/100M Fast Ethernet interfaces for uplink to any third-party Ethernet switch or router
- Temperature, voltage monitoring and alarm
- Auto-shutdown for over temperature
- Surge protection to prevent lightning damage

Dimensions

- 248.2 mm (W) x 285 mm (D) x 44.5 mm (H)

Weight

- 2.9kg

Power Consumption

- 24 watt max
- 100-240VAC/2A, 50/60Hz

Operating Environment

- Temperature: 0 — 50°C; Humidity: 5% — 95%

Storage Environment

- Temperature: -25 — 70°C; Humidity: 5% — 95%

VES-1012 Specifications

Physical Interfaces

- 19” 1U rack-mountable, wall-mountable unit (VES-1012 Only)
- Two Telco-50 connectors, including
  - 1 Telco-50: 12 USER lines (to the VDSL subscriber)
  - 1 Telco-50: 12 CO lines (to the central office or PBX)
- One DB-9F RS-232 local console port
- Two RJ-45 auto-negotiating 10/100M Fast Ethernet ports for uplink connection
- Built-in fans
- Temperature and voltage sensors for monitoring
- Surge protection to prevent lightening damage

Dimensions

- 440mm (W) x 290mm (L) x 43mm (H)

Weight

- 4.4 kg

Power Consumption

- 35 watts maximum
- 100-240VAC/1A, 50/60Hz

Fuse Rated

- T3A250VAC

Operating Environment

- Temperature: 0 — 50°C; Humidity: 5% — 95%

Storage Environment

- Temperature: -25 — 70°C; Humidity: 20% — 95%

Appendix B
Pin Assignments

Console Port Pin Assignments

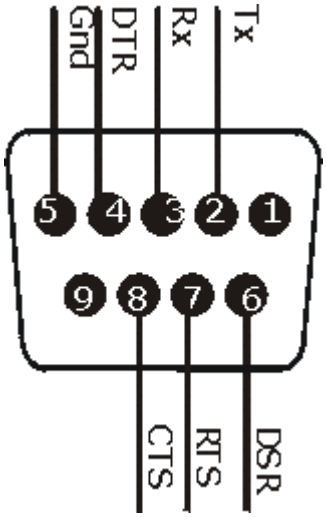


Diagram 1 Console Port Assignments

Telco-50 Pin Assignments for Phone Lines

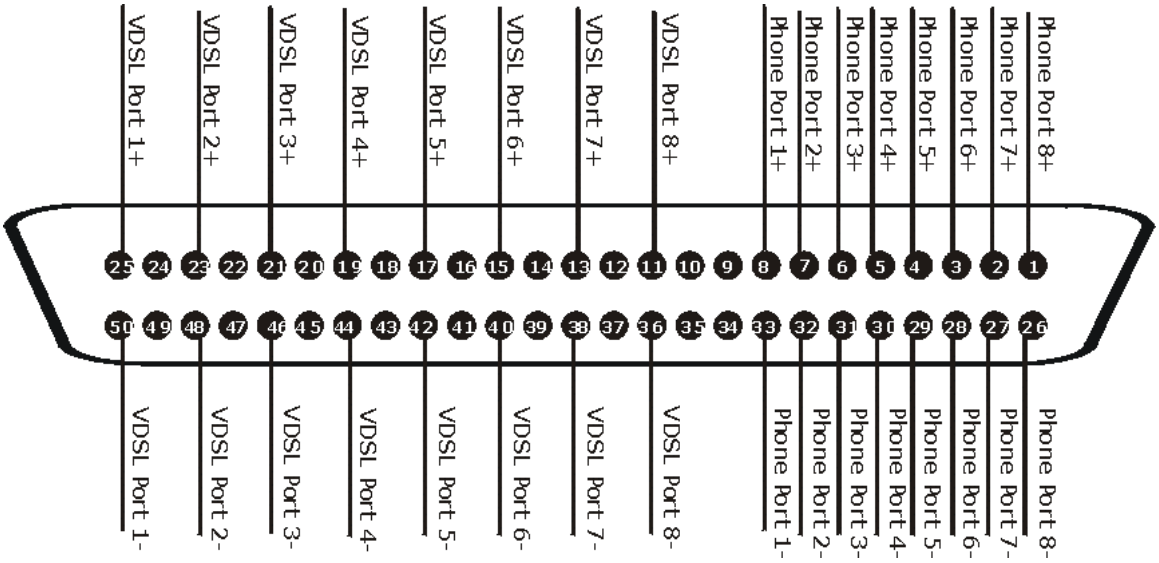

VDSL Port 1+
VDSL Port 2+
VDSL Port 3+
VDSL Port 4+
VDSL Port 5+
VDSL Port 6+
VDSL Port 7+
VDSL Port 8+
Phone Port 1+
Phone Port 2+
Phone Port 3+
Phone Port 4+
Phone Port 5+
Phone Port 6+
Phone Port 7+
Phone Port 8+
25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26
VDSL Port 1-
VDSL Port 2-
VDSL Port 3-
VDSL Port 4-
VDSL Port 5-
VDSL Port 6-
VDSL Port 7-
VDSL Port 8-
Phone Port 1-
Phone Port 2-
Phone Port 3-
Phone Port 4-
Phone Port 5-
Phone Port 6-
Phone Port 7-
Phone Port 8-

Diagram 2 Wiring Diagram for the VES-1008 Telco-50 connector

Pin Assignments for VES-1008 Telco-50 port

PHONE PORT	TELCO-50 PIN ASSIGNMENTS
1	8, 33
2	7, 32
3	6, 31
4	5, 30
5	4, 29
6	3, 28
7	2, 27
8	1, 26
VDSL PORT PINS	**TELCO-50 PIN ASSIGNMENTS**
1	25, 50
2	23, 48
3	21, 46
4	19. 44
5	17, 42
6	15, 40
7	13, 38
8	11, 36

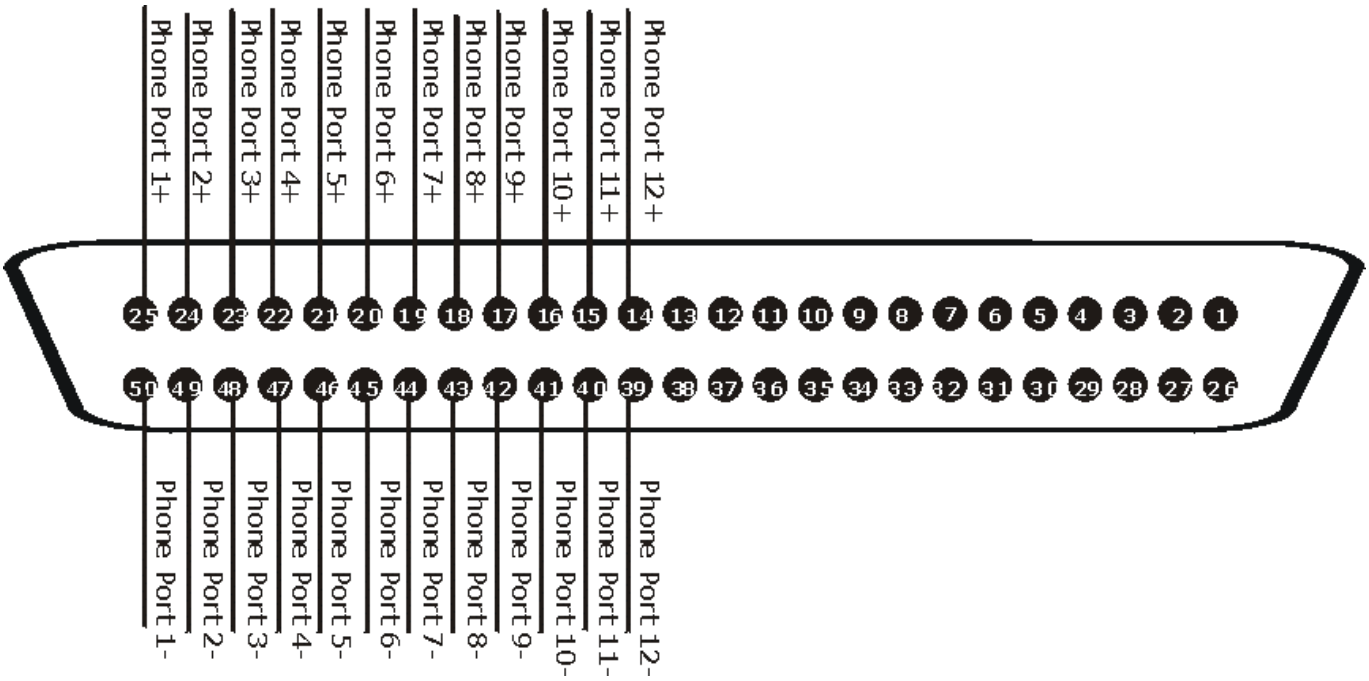

Phone Port 1+
Phone Port 2+
Phone Port 3+
Phone Port 4+
Phone Port 5+
Phone Port 6+
Phone Port 7+
Phone Port 8+
Phone Port 9+
Phone Port 10+
Phone Port 11+
Phone Port 12+
25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26
Phone Port 1-
Phone Port 2-
Phone Port 3-
Phone Port 4-
Phone Port 5-
Phone Port 6-
Phone Port 7-
Phone Port 8-
Phone Port 9-
Phone Port 10-
Phone Port 11-
Phone Port 12-

Diagram 3 Telco-50 Pin Assignments for Phone Lines

Telco-50 Pin Assignments for VDSL Connections

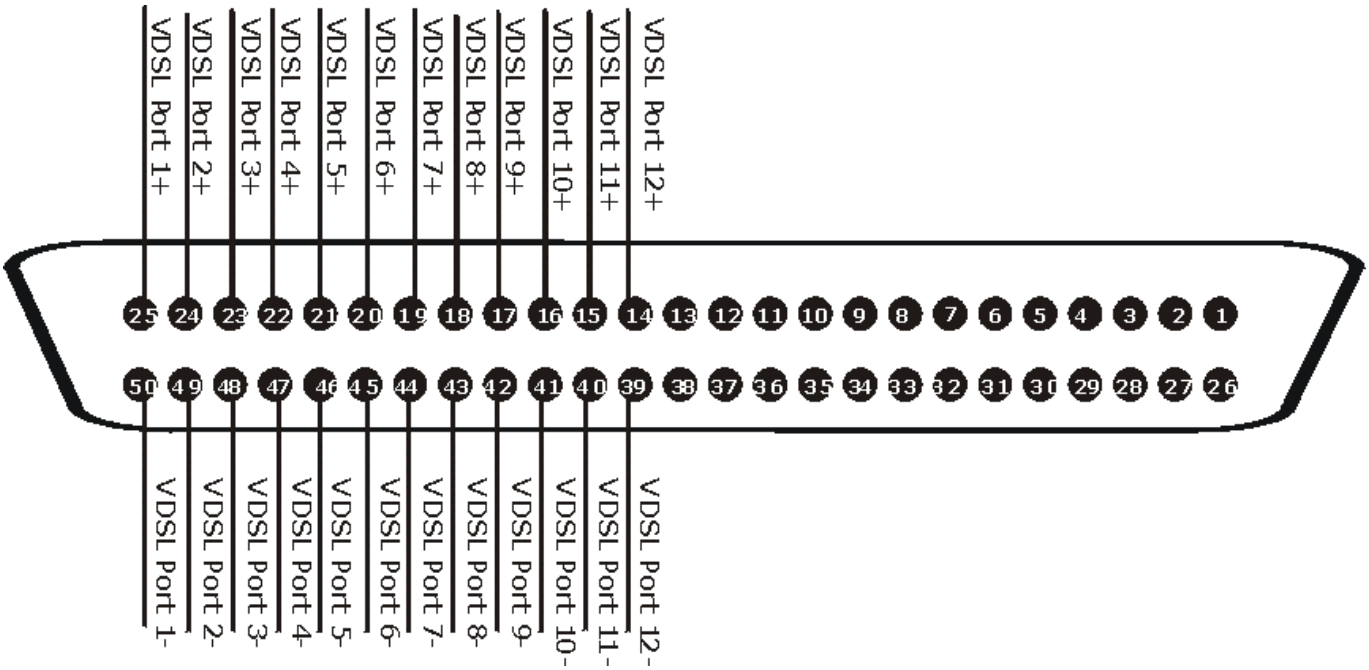

VDSL Port 1+
VDSL Port 2+
VDSL Port 3+
VDSL Port 4+
VDSL Port 5+
VDSL Port 6+
VDSL Port 7+
VDSL Port 8+
VDSL Port 9+
VDSL Port 10+
VDSL Port 11+
VDSL Port 12+
25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26
VDSL Port 1-
VDSL Port 2-
VDSL Port 3-
VDSL Port 4-
VDSL Port 5-
VDSL Port 6-
VDSL Port 7-
VDSL Port 8-
VDSL Port 9-
VDSL Port 10-
VDSL Port 11-
VDSL Port 12-

Diagram 4 Telco-50 Pin Assignments for VDSL Connections

Ethernet Port Pin Assignments

PIN #	RJ-45 (ETHERNET PORT)
1	TX
2	TX
3	RX
4	Not connected
5	Not connected
6	RX
7	Not connected
8	Not connected

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